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Ministry of Defence

Thu, 24 Sept 2020 4:28PM

Another industry support measure by DRDO

As another measure to support industry, requirement of "Performance Security" for the "Development Contracts" by DRDO and ATPV has been waived as per the approval of Raksha Mantri Shri Rajnath Singh. This will apply to development contracts only, as defined in para 12.5 of the DRDO Procurement Manual, PM 2016, as amended. However, Warranty Bond would continue to be obtained from successful development partner to cover the DRDO/ ATPV interest during the warranty period.

This provision will be applicable for all RFPs issued in respect of development contracts after the date of issue of this amendment that is 23 September 2020. All ongoing cases of development contracts in which Request for proposal (RFP)/ contract has already been issued may continue to be regulated as per the provisions contained in the issued RFP/ contract.

Secretary DD R&D and Chairman DRDO Dr G Satheesh Reddy stated that it is another important milestone to support Industry.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1658680>



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रक्षा मंत्रालय

Thu, 24 Sept 2020 4:28PM

उद्योग जगत की मदद की दिशा में डीआरडीओ ने किया एक और महत्वपूर्ण बदलाव

रक्षामंत्री श्री राजनाथ सिंह की स्वीकृति के बाद डीआरडीओ और एटीवीपी ने उद्योगों को मदद करने के लिए एक और उपाय के तौर पर "विकास संविदाओं" में "प्रदर्शन सुरक्षा" के नियम को खत्म कर दिया है। यह छूट केवल विकास संविदाओं के लिए है जैसा कि डीआरडीओ की खरीद नियमावली (पीएम-2016) के पैरा 12.5 में उल्लेखित और संशोधित किया गया है। हालांकि वारंटी की अवधि के दौरान डीआरडीओ और एटीवीपी के हितों को संरक्षित करने के लिए सफल विकास साझेदारों से वारंटी बॉन्ड प्राप्त करने की प्रक्रिया जारी रहेगी।

यह प्रावधान संशोधित की गई तिथि- 23 सितंबर, 2020 से विकास से जुड़ी सभी संविदाओं के लिए निविदाएँ आमंत्रित करने (आरएफपी) पर लागू होंगे। विकास संविदाओं से जुड़ी जिन निविदाओं या संविदाओं को पहले ही जारी किया जा चुका है उनके लिए आरएफपी में दर्ज प्रावधान ही लागू होंगे।

डीआरडीओ के अध्यक्ष और सचिव डीडी आर एंड डी डॉ. जी सतीश रेड्डी ने इस संबंध में कहा कि उद्योग जगत को मदद करने की दिशा में यह एक और महत्वपूर्ण मील का पत्थर होगा।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1658724>



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రక్షణ మంత్రిత్వ శాఖ

Thu, 24 Sept 2020 4:28PM

డీఆర్డీవో నుంచి పరిశ్రమలకు మద్దతునిచ్చే మరో అడుగు

ప్రస్తుత కొవిడ్ పరిస్థితుల్లో, పరిశ్రమలకు సాయం చేసేలా మరో అడుగు పడింది. రక్షణ శాఖ మంత్రి శ్రీ రాజ్ నాథ్ సింగ్ అనుమతి మేరకు, డీఆర్డీవో, ఏటీవీపీ ద్వారా "అభివృద్ధి ఒప్పందాల" కోసం "పనితీరు భద్రత" అవసరాన్ని రద్దు చేశారు. కొత్త సవరణ ప్రకారం, డీఆర్డీవో 'ప్రొక్యూర్మెంట్ మాన్యువల్'-పీఎం, 2016లోని 12.5 పేరాలో పేర్కొన్న విధంగా, ఈ రద్దు కేవలం అభివృద్ధి ఒప్పందాలకు మాత్రమే పరిమితం. వారంటీ వ్యవధిలో, డీఆర్ డీవో/ఏటీవీపీ ఆసక్తి ప్రకారం, విజయవంతమైన అభివృద్ధి భాగస్వామి నుంచి వారంటీ బాండ్ పొందే విధానం కొనసాగుతుంది.

ఈ సవరణను అమల్లోకి తెచ్చిన తేదీ (23 సెప్టెంబర్ 2020) తర్వాత అభివృద్ధి ఒప్పందాలకు సంబంధించి జారీ అయిన అన్ని ఆర్ఎఫ్పీ (ప్రతిపాదన కోసం విజ్ఞప్తి)లకు ఈ నిబంధన వర్తిస్తుంది. ప్రతిపాదన/ఒప్పందం కోసం ఇప్పటికే విజ్ఞప్తి జారీ అయిన అభివృద్ధి ఒప్పందాలకు సంబంధించి కొనసాగుతున్న కేసులపై... జారీ అయిన ఆర్ఎఫ్ పీ/ఒప్పందంలో ఉన్న నిబంధనల ప్రకారం నియంత్రణ ఉంటుంది.

పరిశ్రమలకు మద్దతులో దీనిని మరో ముఖ్యమైన మైలురాయిగా డీఆర్డీవో చైర్మన్ డా.బి.సతీష్ రెడ్డి పేర్కొన్నారు.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1658799>

DRDO waives 'performance security' for development contracts as an incentive for the private sector

By Prabhjote Gill

- *The Defence Research and Development Organisation (DRDO) will no longer require 'performance security' for any new development contracts.*
- *The move will further remove the red tape between the industry and the government and hopefully incentivise participation, according to the Ministry of Defence (MoD).*
- *However, a Performance cum Warranty Bond will still be required from successful development partners to cover DRDO's interest during the warranty period.*

India's Defence Minister Rajnath Singh approved Defence Research and Development Organisation (DRDO) waiving the requirement of 'performance security' for development contracts under its helm as a move to incentivise the private sector's participation.

The same will also be true for the Indian Navy's Advanced Vessel Project (ATVP) to design and construct a submarine with Russia. The new submarines will be customised to Indian systems, including the Brahmos missile.

"This provision will be applicable to all RFPs (requests for procurement) issues in respect of develo contracts after the date of issue of this amendment that is 23 September 2020," said the Ministry of Defence (MoD) in a statement.

All existing development contracts, where the RFP has already been issued, will continue to be regulated as per the provisions outlined in the contract.

What is performance security?

Performance security is one of the requirements for obtaining a Letter of Credit (LC) from the bank — an undertaking given by it on behalf of the buyer to pay the seller. It is one of the banking instruments to facilitate foreign payments, according to the DRDO's procurement manual.

What is a development contract?

"Developmental contract is concluded for the development of an item as per given design and specifications by DRDO for producing a specified quantity by the selected development partner," outlines DRDO's manual. These contracts may subsequently lead to production contracts with unit production cost worked out based on successful completion of the contract.

Should that be the case, DRDO will then require a Performance cum Warranty Bond. In issuing this, the seller is promising performance of the contract till the warranty period. It usually pegged at 5% to 10% of the total contract value. For Indian partners, the Performance cum Warranty Bond may be accepted in the form of a bank draft, fixed deposit receipt, banker's cheque or a bank guarantee.

For foreign bidders, it may be accepted in the form of a bank guarantee or 'stand-by' LC.

Chairman DRDO Satheesh Reddy stated that it is another important milestone to support Industry.

<https://www.businessinsider.in/defense/news/drdo-waives-performance-security-for-development-contracts-as-an-incentive-for-the-private-sector/articleshow/78295788.cms>

रक्षा उद्योग को समर्थन देने के लिए एक अन्य उपाय पारित, मंत्रालय ने दी जानकारी

नई दिल्ली: रक्षा उद्योग और विकास संगठन (डीआरडीओ) और उन्नत प्रौद्योगिकी वेसल प्रोजेक्ट (एटीवीपी) द्वारा रक्षा मंत्री राजनाथ सिंह के अनुमोदन के अनुसार रक्षा उद्योग को समर्थन देने के लिए एक अन्य उपाय किया गया है। इसके तहत विकास अनुबंध के लिए प्रदर्शन सुरक्षा की आवश्यकता को समाप्त कर दिया गया है। रक्षा मंत्रालय ने इसकी जानकारी दी है।

मंत्रालय ने बताया है कि यह केवल डीआरडीओ रक्षा खरीद मैनुअल, पीएम 2016 के संशोधित पैरा 12.5 में परिभाषित विकास अनुबंधों पर लागू होगा। हालांकि, वारंटी अवधि के दौरान डीआरडीओ/एटीवीपी के फायदे को कवर करने के लिए भागीदार से वारंटी बॉन्ड प्राप्त किया जाना जारी रहेगा।

इसने कहा कि यह इस संशोधन के जारी होने की तिथि के बाद विकास अनुबंधों के संबंध में जारी सभी आरएफपी के लिए लागू होगा। जिन विकास अनुबंधों में आरएफपी/अनुबंध पहले ही जारी किए जा चुके हैं, उनके जारी होने वाले आरएफपी/अनुबंध के प्रावधानों के अनुसार नियमित किए जा सकते हैं।

<https://www.amarujala.com/india-news/another-measure-passed-to-support-defense-industry-drdo-atvp-ministry-informed>



Thu, 24 Sept 2020

Nuke capable Prithvi-II night trial successful

The single stage liquid propelled weapon developed by DRDO was inducted into the Armed Forces in 2003 and is into series of production since then

Bhubaneswar: The Strategic Forces Command of Indian Army on Wednesday successfully conducted a night trial of nuclear-capable ballistic missile Prithvi-II from a defence test facility off Odisha coast. Mounted on a Mobile Tatra transporter-erector Launcher (MTL), the short-range surface-to-surface missile was test fired from the launching complex III (LC-III) of the Integrated Test Range (ITR) at about 7.30 pm.

Equipped with a state of the art guidance system the indigenously developed missile was fired in a real-time in full operational configurations. "This was a copy book success and the missile travelled nearly 300 km as coordinated. It was a successful mission accomplished," said a defence official.

The test came a day after the Defence Research and Development Organisation (DRDO) successfully test fired a laser guided anti tank missile from MBT Arjun at KK Ranges, Ahmednagar in Maharashtra. Capable of tracking the targets with the help of laser designation to ensure precision hit accuracy, the missile engaged a target located at 3 km.



Prithvi-II missile being tested off the Odisha coast. (Photo | EPS)

However, the night trial of Prithvi assumed significance as the missiles fired in the dark are difficult to be tracked and shot down. Prithvi-II, capable of attacking targets at a range of 350 km, is India's first developed and inducted indigenous surface-to-surface strategic missile.

The test proved the reliability of the weapon and reconfirmed its operational readiness. It can be fired anytime and in any terrain in short notice. All the radars, electro-optical systems located along the coast have tracked and monitored all the parameters of the missile throughout the flight path.

Guided all through by an inertial navigation system and controlled by the thrust vector control and aero-dynamic control systems, the missile reached the predefined target in the Bay of Bengal with a very high accuracy of better than 10 meters.

The nine meter long missile with a diameter of one metre has the capability to carry one tonne of warhead. The missile thrust by liquid propulsion twin engine uses an inertial guidance system while the warhead uses a radar correlation terminal guidance system.

The single stage liquid propelled weapon developed by DRDO was inducted into the Armed Forces in 2003 and is into series of production since then. One of the missiles drawn from the inventory was used for the test. Two rounds of the tests of the missile were conducted during night in November last year.

<https://www.newindianexpress.com/states/odisha/2020/sep/24/nuke-capable-prithvi-ii-night-trial-successful-2201239.html>

THE ECONOMIC TIMES

Fri, 25 Sept 2020

Indigenously developed Prithvi-II missile testfired

Synopsis

The trial of the missile, which has a strike range of 350 km, was carried out from a mobile launcher from launch complex-3 of the ITR, a DRDO official said.

Balasore: India on Wednesday conducted a successful night testfire of its indigenously developed nuclear capable surface-to-surface Prithvi-II missile as part of a user trial by the Army from a base in Odisha, defence sources said.

The state-of-the-art missile was testfired from the Integrated Test Range (ITR) at Chandipur near here in darkness and the trial was successful in meeting all the parameters, they said.

The trial of the missile, which has a strike range of 350 km, was carried out from a mobile launcher from launch complex-3 of the ITR, a DRDO official said.

Describing the trial as a routine exercise, he said, the missile trajectory was tracked by radars, electro-optical tracking systems and telemetry stations by the DRDO along the coast of Odisha.

The missile was randomly chosen from the production stock and the entire launch activity was carried out by Strategic Force Command (SFC) of the Army and monitored by scientists of Defence Research and Development Organisation (DRDO) as part of the training exercise, official sources said.

The downrange teams on board a ship deployed near the designated impact point in the Bay of Bengal monitored the terminal events and splashdown.

The last night time testfire of Prithvi-II was conducted successfully from the ITR on November 20, 2019.

Prithvi-II is capable of carrying 500 to 1,000 kg of warheads and is powered by liquid propulsion twin engines, the sources said.



The state-of-the-art missile uses an advanced inertial guidance system with maneuvering trajectory to hit its target, they said.

Already inducted into the armoury of the defence forces in 2003, nine-metre long 'Prithvi' was the first missile to have been developed by DRDO under the Integrated Guided Missile Development Programme (IGMDP).

<https://economictimes.indiatimes.com/news/defence/indigenously-developed-prithvi-ii-missile-testfired/articleshow/78281653.cms>



Thu, 24 Sept 2020

Indigenously developed nuclear capable Prithvi-II missile testfired from ITR

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File image

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<https://www.moneycontrol.com/news/india/indigenously-developed-nuclear-capable-prithvi-ii-missile-testfired-from-itr-5877411.html>

बालासोर तट पर DRDO ने किया शॉर्ट रेंज बैलिस्टिक मिसाइल पृथ्वी का सफल परीक्षण

ओडिशा के बालासोर तट पर स्ट्रेटेजिक फोर्स कमांड (SFC) ने भारतीय रक्षा अनुसंधान और विकास संगठन (DRDO) द्वारा तैयार शॉर्ट रेंज बैलिस्टिक मिसाइल (Prithvi short-range ballistic missile) पृथ्वी का सफल परीक्षण किया है।
By Aishwary Rai

हाइलाइट्स:

- शॉर्ट रेंज बैलिस्टिक मिसाइल पृथ्वी का सफल परीक्षण
- अंधेरे में दागी गई DRDO की तैयार अत्याधुनिक मिसाइल
- ITR के प्रक्षेपण परिसर-3 से एक मोबाइल लॉचर से दागा गया

बालासोर: रक्षा के क्षेत्र में खुद को और मजबूत बनाते हुए भारत ने बड़ी सफलता हासिल की है। स्ट्रेटेजिक फोर्स कमांड (SFC) ने भारतीय रक्षा अनुसंधान और विकास संगठन (DRDO) द्वारा तैयार शॉर्ट रेंज बैलिस्टिक मिसाइल (Prithvi short-range ballistic missile) पृथ्वी का सफल परीक्षण किया है।

ओडिशा के बालासोर तट पर बुधवार को अंतरिम टेस्ट रेंज से इस मिसाइल का सफलतापूर्वक परीक्षण किया गया। इस मिसाइल ने अपने मिशन के हर उद्देश्य को पूरा किया, जिसे SFC ने निर्धारित किया था। सतह से सतह पर मार करने वाली यह मिसाइल परमाणु हथियार ले जाने में सक्षम है।

प्राप्त जानकारी के अनुसार चांदीपुर स्थित एकीकृत परीक्षण केंद्र (ITR) से इस अत्याधुनिक मिसाइल को अंधेरे में दागा गया। यह परीक्षण सफल रहा, जिसने सभी मानकों को प्राप्त कर लिया। DRDO के एक अधिकारी ने बताया कि 350 किलोमीटर की दूरी तक मार करने वाली इस मिसाइल को आईटीआर के प्रक्षेपण परिसर-3 से एक मोबाइल लॉचर से दागा गया।

बता दें कि पृथ्वी, सतह से सतह पर मार करने वाली शॉर्ट रेंज बैलिस्टिक मिसाइल है। करीब आधे टन का वारहेड उठा सकने में सक्षम यह मिसाइल 150 से 600 Km तक वार कर सकती है। पृथ्वी सीरिज की तीन मिसाइलें हैं- पृथ्वी-I, II, III। इनकी मारक क्षमता क्रमशः 150 Km, 350 Km और 600 Km तक है।

<https://navbharattimes.indiatimes.com/state/other-states/other-cities/successful-testfiring-of-the-prithvi-short-range-ballistic-missile-developed-by-drdo-at-balasore/articleshow/78287708.cms>



सांकेतिक तस्वीर

Artillery barrel hit: Concerns over charge in ammo

By Shishir Arya

Nagpur: The 155x52 mm advanced towed artillery gun system (ATAGS), claimed to have the world's longest range of 48km, suffered a barrel burst during trials last week. Now, concerns have been raised that the method of firing the ammunition used at present may affect the gun's performance.

The guns have been made by Bharat Forge and Tata Power, and were being tested with shells made by Ordnance Factory Board (OFB) at the Pokhran range when the accident took place. An investigation is underway in the matter.

To achieve a higher range, a shell has to be fired with extra charge or explosive. In ATAGS, the shell was fired with seven charge modules. Higher charge increases the pressure, which, beyond a certain limit, can affect the shell's movement. This can lead to accidents like barrel hit, said sources.

It is learnt that concerns were raised about the safety of firing the shells with higher charge a few days before the accident. The OFB, which makes the shell, refused to comment on the issue.

The ATAGS has been designed by Pune's Armament Research and Development Establishment (ARDE), a unit of Defence Research and Development Organization (DRDO). The gun made by Tata Power suffered the barrel hit. The barrel in both Tata and Bharat Forge guns have been made by the latter.

The ATAGS is designed to achieve a range of 42km and beyond. In 2017, it had achieved a record range of 48km.

The shells for 155mm calibre howitzers made by the ordnance factory are designed to be fired with up to six charge modules and handle pressure up to 340 megapascals. To make the shell fly over 40km, seven charge modules are used. The OFB shells are made under transfer of technology (TOT) from South African company Dennel. Even in the TOT, it has been specified that the gun can handle service pressure of 340 megapascals, or six charge modules at the most.

This is called zone 6 ammunition, and what has been used in ATAGS was zone 7. Higher pressure due to zone 7 can lead to risks. Zone 6 is the standard world over, the sources said.

OFB only makes zone 6 ammunition, which is in line with NATO standards. Even the 155x52 calibre mounted gun system developed by the OFB uses zone 6, a source said.

An official in one of the private companies confirmed that the shell was fired with zone 7 ammunition to achieve a higher charge, and rejected any claim that they had received any warning. So far, both Bharat Forge and Tata guns have fired over 1,000 rounds using the zone 7 rounds. The ATAGS barrel is designed to handle 440 megapascals of pressure.

"The pressure handling capacity is basically meant for the barrel but even the shell is expected to withstand similar levels," the source said. A final investigation into the incident will only reveal the truth said the company official.

<https://timesofindia.indiatimes.com/city/nagpur/artillery-barrel-hit-concerns-over-charge-in-ammo/articleshow/78284996.cms>

What are India's plans for Directed Energy Weapons?

DEWs are yet to be deployed by any country's military, but are widely seen as a critical part of future warfare

By Rajeswari Pillai Rajagopalan

India's Defense Research and Development Organisation (DRDO) announced earlier this month that it plans to develop directed energy weapons (DEWs) using high-energy lasers and microwaves. DEWs are emerging military technologies that are yet to be deployed by any military force but are seen as critical in future warfare. According to media reports, India has developed a national plan with short, medium and long term goals to develop a series of DEW variants with up to 100 kilowatts of power. This is being planned in a collaborative mode, to eventually partner with and benefit from the domestic private sector. While India is still in the early stages of developing this technology and nowhere near possessing an operational capability, advances in such technologies will have implications for both national and regional security.

Development of DEWs is seen as particularly important in the context of India's worsening security environment, especially its ties with China. The continuing military confrontation in eastern Ladakh is a reminder of the challenges that China poses to India. Beijing's growing military power, including in space, cyber and electronic warfare domains, can inflict significant damage on its adversaries, including India. China is also developing DEW technologies. Indeed, India is probably developing its own DEWs as a response.

Delivering the 12th annual Air Chief Marshal L.M. Katre memorial lecture in August 2019, Dr. G. Satheesh Reddy, the head of the DRDO said, "DEWs are extremely important today. The world is moving towards them. In the country too, we are doing a lot of experiments. We have been working in this area for the past three to four years to develop 10-kW and 20-kW [weapons]." In August 2017, the DRDO is reported to have tested a 1-kilowatt laser weapon at Chitradurga in the South Indian state of Karnataka, on a target 250 meters away. Then Defense Minister Arun Jaitley is believed to have been present for the test. This is far from being a usable weapon, of course: in addition to the limited distance of the target, the laser also reportedly took 36 seconds to create a hole on the target metal sheet. The Centre for High Energy Systems and Sciences and Laser Science & Technology Centre, two DRDO laboratories, are working on the project.

In 2018, while responding to a question in the Indian Parliament on the DRDO's major technological developments, the minister of state for defense stated that the DRDO has developed a vehicle-mounted high-power laser-directed energy system for use against drones. The anti-drone system will supposedly be eventually manufactured in large quantities through the involvement of the Indian private sector. Two models have been developed in this regard: the first can be fielded on a trailer and has a 10-kilowatt laser to target aerial targets within a 2-kilometer range, whereas the second is believed to be a compact tripod-mounted system, mounted with a 2-kilowatt laser designed to operate at a range of 1 kilometer. Officials cited in one report claim that these have been displayed to the armed forces and other relevant agencies and note that these are capable of taking out mini-drones by jamming the command and control systems or by damaging the on-board electronic systems. This system is capable of detecting and jamming micro-drones to a distance of up to 3 kilometers and engaging a target within a range of 1-1.25 kilometers.

India is also reported to have developed a system called KALI, or "kilo ampere linear injector," a linear electron accelerator for targeting long-range missiles. Once a missile launch is detected, KALI is supposed to "quickly emit powerful pulses of Relativistic Electrons Beams (REB)" that can damage electronic systems on-board. KALI has been developed by the DRDO and the Bhabha

Atomic Research Centre (BARC). It was first proposed in 1985 by the then-BARC Director Dr. R. Chidambaram. Work on the project is reported to have begun in 1989. At a BARC Foundation Day speech in 2004, the BARC director said that a “high power pulse electron accelerator KALI-5000 has been commissioned at an energy of 650 keV and an electron beam power of 40 GW. High power microwaves having frequency in the range of 3-5 GHz and power 1-2 GW have been generated.” Despite this acknowledgement of the existence of such a system, there is very little information in the public domain. The government has not divulged any information, even in parliament. For instance, more than a decade later, in 2015, while responding to a question in parliament as to whether there are any plans to induct KALI 5000 in the Indian military, Defense Minister Manohar Parikkar simply stated, “The desired information is sensitive in nature and its disclosure is not in the interest of national security.”

While details are sketchy, the technological roadmaps for the next decade developed by the Indian defense establishment in 2013 and 2018 articulated some of the military’s requirements. Media reports said that according to Phase I of the roadmap, the Indian Army and the Indian Air Force require a minimum of 20 “tactical high-energy laser systems” that are capable of destroying “small aerial targets” and electronic warfare systems at a range of 6-8 kilometers. In Phase II, the demand is to have laser systems that have a range of over 20 kilometers to target “soft-skinned” vehicles and forces from both land and air.

But India’s DEW technological capabilities are still in the nascent stage, and are not yet comparable to the more powerful systems of countries like the U.S., Russia and China. While the effectiveness of these weapons remains unknown because of the lack of open source information, it is quite likely that these will mature in the coming decade.

Of course, these systems bring their own advantages and disadvantages. Laser weapons, for instance, have the capability to be focused precisely, which allows for effective targeting. On the other hand, though microwaves cannot be aimed like lasers, their ability to damage electronic systems without causing casualties opens up other options. In fact, a report produced by the U.S. Center for Strategic and Budgetary Assessments (CSBA) details many illustrative scenarios as to how these weapon systems could be effectively used in contactless warfare in the future.

Indian security analysts argue that the country could be vulnerable as technology advances in India’s neighborhood. They also recommend that India consider the possibility of developing an offensive capability in this regard. Given the intensifying security dynamics in the Indo-Pacific and beyond, all the major powers including India are likely to accelerate the pursuit of these technologies.

<https://thediplomat.com/2020/09/what-are-indias-plans-for-directed-energy-weapons/>

THE ECONOMIC TIMES

Fri, 25 Sept 2020

Government to completely withdraw border guarding forces from internal security duty

Synopsis

According to the proposal, the Ministry of Home Affairs (MHA) is working on a new "model" where the burden of internal security duties, including conduct of elections, will be largely borne by the country's largest paramilitary force, the Central Reserve Police Force.

New Delhi: The government is working on an "ambitious" plan to gradually withdraw border guarding forces like the BSF, the ITBP and the SSB from internal security duties in order to strengthen protection at various frontiers of the country, official sources said on Thursday. They said the proposal was first discussed during a meeting of these forces chaired by Union Home Minister Amit Shah last year.

According to the proposal, the Ministry of Home Affairs (MHA) is working on a new "model" where the burden of internal security duties, including conduct of elections, will be largely borne by the country's largest paramilitary force, the Central Reserve Police Force (CRPF).

The 3.25 lakh strong CRPF is already designated as the lead internal security force of the country.

Officials in the security establishment, quoting the proposal, said that a new experiment will be put in place during the forthcoming elections in Bihar and bypolls in some states where the CRPF will be deployed in a 70:30 ratio along with state police forces.

"The CRPF will be the overall security in-charge during conduct of polls. Border guarding forces like the Border Security Force, the Indo-Tibetan Border Police Force and the Sashastra Seema Bal will be gradually withdrawn from these duties," a senior official said.

"It is envisaged by the home ministry that these three forces will be taken off completely from rendering routine internal security duties like elections and law and order duties in aid to state governments over the next few years," the official said.

Every year, thousands of troops of these border forces are withdrawn from the front and sent for conduct of elections apart from duties to strengthen law and order arms of various state police forces in view of the challenging internal security scenario in their domains.

The official said the border guarding forces have already been directed to strengthen security at their respective fronts including by operationalising more posts and reducing inter-border out post distance.



The government is working on an "ambitious" plan to gradually withdraw border guarding forces like the BSF, the ITBP and the SSB from internal security duties in order to strengthen protection at various frontiers of the country

While the BSF is tasked with guarding sensitive international borders with Pakistan (over 3,300 km) and Bangladesh (4,096 km), the ITBP mans the 3,488- km-long Line of Actual Control (LAC) with China while the SSB guards open Indian fronts with Nepal (1,751 km) and Bhutan (699 km).

The Assam Rifles, under the administrative control of the MHA but manned by army personnel and officers, guards the border with Myanmar.

The home ministry has also directed the three border forces to create a team of their "young officers" who will traverse through the entire border area under their charge and bring to record the "smallest of security challenges" for discussion and resolution.

The ministry has also proposed that a special cell be created in the Central Bureau of Investigation (CBI) to deal with border crime cases like cattle smuggling and check activities of smugglers, fake Indian currency notes operatives and corrupt government officers.

A team of officers of these frontier guarding forces has also been created who have been tasked with finding ways to ensure that migration of border population is stopped and they are provided work opportunities in their local areas, the officer said.

The ministry, as per the proposal, has also directed that a committee of officers headed by the Union home secretary should discuss development of new technology tools for border guarding in consultation with the Defence Research and Development Organisation (DRDO) and the Bharat Electronics Limited (BEL).

A specific mention has been made to find solutions, with help from agriculture experts, to check the menace of 'sarkanda' or elephant grass along the international border with Pakistan.

The elephant grass aids terrorists to infiltrate, smuggle narcotics and dig tunnels as it cuts the line of vision of BSF troops who guard the area, the officer said.

A review of these issues is expected to be held by the home ministry next month, an officer in the ministry said.

<https://economictimes.indiatimes.com/news/defence/government-to-completely-withdraw-border-guarding-forces-from-internal-security-duty/articleshow/78295122.cms>

THE ECONOMIC TIMES

Fri, 25 Sept 2020

Rafale offsets: New fighter jet engine complex coming up, French assistance likely

By Manu Pubby

Synopsis

The new engine complex is being set up as a national mission to develop a 110 kilo newton powered engine for the future class of advanced medium combat aircraft (AMCA) and could produce the engine within seven years of starting work.

New Delhi: Even as the central auditor has raised questions on non-completion of high end technology transfer as part of the Rafale fighter jet offsets deal, ET has learnt that a new fighter jet engine complex spearheaded by the Defence Research and Development Organisation (DRDO) is in the works, with advanced discussions on for a completely new engine for future Indian fighters with a French manufacturer.

The new engine complex is being set up as a national mission to develop a 110 kilo newton powered engine for the future class of advanced medium combat aircraft (AMCA) and could produce the engine within seven years of starting work.

French engine manufacturer Safran has offered a compete technology transfer to develop the engine and use the offset credits from the Rafale deal and is also tying up with Hindustan

Aeronautics Limited NSE 1.02 % (HAL) for transferring manufacturing technology for high end engines.

“We are signing an agreement related to the technology needed for high thrust engine manufacturing. The technology will be common to the Rafale engines that can be supported by us and would also be useful for the 110 kn engine project,” HAL Chairman R Madhavan told ET.

While the new engine complex is yet to be set up, the broad understanding is that it would cater to high end fighter jet engines while HAL would be involved in lower thrust engines for helicopters, light transport aircraft, UAVs and trainers.

HAL is also likely to be part of the 110 kn engine project as a manufacturing partner. As reported by ET, the air force is keen that the future AMCA fighter jet be powered by an indigenous engine to ensure self reliance. While the first squadron of the AMCA fighters would need a foreign engine due to timelines, future squadrons would be powered by an Indian engine, which could possibly be christened the Kaveri.

As reported, in a report referring to the Rafale fighter jet deal, the Comptroller and Auditor General (CAG) pointed out on Wednesday that plans for transfer of high end technology as part of the offsets deal have not been completed and it not clear if it will even take place in the future.

ET has been reporting that plans to use the Rafale offsets for obtaining jet engine technology has been hanging since 2016, even though French company Safran has been in talks with Indian stakeholders. French companies can modify offset plans at any point but have a huge obligation - to the tune of 3.5 billion Euro – that need to be completed in the next three years, though this timeline can be extended by the government.

<https://economictimes.indiatimes.com/news/defence/rafale-offsets-new-fighter-jet-engine-complex-coming-up-french-assistance-likely/articleshow/78303363.cms>



Fri, 25 Sept 2020

India underlines stability on ground ahead of fresh round of talks with China

The two sides had decided to have the next meeting of the corps commanders “at the earliest”, external affairs ministry spokesperson Anurag Srivastava told a weekly news briefing

By Reazual H Laskar

New Delhi: India and China are set to hold another round of diplomatic and military talks to try and take forward the disengagement process along the Line of Actual Control (LAC), with New Delhi on Thursday pressing for stability at the friction points in Ladakh sector.

A meeting of the Working Mechanism for Consultation and Coordination (WMCC) on border affairs is expected to be held before the seventh round of talks between military commanders, people familiar with developments said on condition of anonymity. The dates for both meetings are yet to be finalised, they said.

The two sides had decided to have the next meeting of the corps commanders “at the earliest”, external affairs ministry spokesperson Anurag Srivastava told a weekly



An IAF aircraft flies in the Ladakh region. (Representational Photo/PTI)

news briefing. “In parallel, the next meeting of the WMCC is also likely to take place soon,” he said, without giving details.

The sixth meeting of the corps commanders, held at Moldo on the Chinese side of the LAC on September 21, ended inconclusively on the main issue of disengagement after more than 13 hours of talks. The commanders met after nearly 50 days, and the only headway was a rare joint statement from the armies of the two sides that said they had agreed to stop sending more troops to the frontline and to refrain from unilaterally changing the situation on the ground.

The external affairs ministry, which was part of the military talks for the first time on Monday, insisted that adhering to this agreement would be key for the upcoming talks. “Even as two sides work towards complete disengagement in all friction areas, it is at the same time also necessary to ensure stability on the ground,” Srivastava said.

He added, “The way ahead will be to refrain from making any attempts to unilaterally change the status quo, while the two sides continue their discussions to achieve complete disengagement in all friction areas and to ensure full restoration of peace and tranquillity in the border areas.”

Srivastava also highlighted that this was the first joint statement issued after any meeting of the corps commanders, and it reflected the “stated commitment of both sides to disengage along the LAC”. Disengagement, he pointed out, is a “complex process that requires redeployment of troops by each side towards their regular posts on their respective sides of the LAC”, and this would require “mutually agreed reciprocal actions”.

The last meeting of the corps commanders provided them an opportunity to have candid and in-depth exchanges on stabilising the situation along the LAC, he said. The two sides also decided to strengthen ground communications to avoid any further misunderstandings and misjudgements, and to avoid any actions that may complicate the situation, he said.

The people cited above said India would stick to its demand for a comprehensive disengagement at all friction points, instead of a piece-meal approach suggested by the Chinese side. India will also insist on restoration of the status quo as it existed in April so that the ultimate goal of de-escalation along the LAC can be achieved, the people said.

China has been asking India to withdraw its troops from strategic heights on the southern bank of Pangong Lake as a prerequisite for disengagement at other friction points but this has been ruled out by the Indian side.

Before the last corps commanders’ meeting, the defence ministers of the two sides met in Moscow on September 4 and this was followed by talks between the two foreign ministers, also in Moscow, on September 10. The foreign ministers had reached agreement on a five-point roadmap for comprehensive disengagement in all the friction areas.

Former ambassador Rajiv Bhatia, distinguished fellow for foreign policy studies at Gateway House, said that with the border standoff now into its fifth month and winter about to set in, the endeavour by both sides appeared to be to prevent any further escalation.

“However, I still take comfort from the desire on both sides to prevent further escalation, to ensure stability and to continue talking. It is a positive sign at the political level that there is a similar message from both sides – that there is no question of an armed conflict and peaceful negotiations are the way forward – though there is little less clarity in the messaging from Chinese side,” he said.

“Combined with the onset of winter and some luck, there will be no further escalation while we await a breakthrough. Both sides need more time to resolve these complex matters.”

<https://www.hindustantimes.com/india-news/india-underlines-stability-on-ground-ahead-of-fresh-round-of-talks-with-china/story-u54kjGuce1HuJEn2PPYQCI.html>

LAC face-off: India will hold key heights till signs of China withdrawal

By Rajeev Deshpande & Indrani Bagchi

The recent understandings between India and China — by the foreign ministers in Moscow on September 10 and military commanders on Tuesday — are intended to begin the process of a limited disengagement and ensure a continued ‘standstill’ at the Line of Actual Control amid a deep trust deficit between the two sides.

Confirming that meaningful disengagement would depend on the political intent of the Chinese leadership and its willingness to de-escalate on the ground, Indian sources said the two joint statements should be read only to prevent provocative jostling at friction points on the LAC which could flare into hostilities even as India remains prepared for all eventualities.



A key decision is to stop sending more troops to the frontlines in eastern Ladakh, and keep troops at a ‘safe’ distance from each other and reopen real-time communications, which had frozen. This is intended to ensure a halt to the relentless build-up on the LAC, as a precursor to further steps in the disengagement exercise.

India will continue to insist on status quo ante as in April but the process has now become more complicated after Indian forces seized strategic heights in the southern bank of Pangong Tso and repositioned themselves on the northern bank.

This not only alters the post-Galwan situation but is also not in conformity with ‘status quo’ that prevailed in April. Until the current face-off, Indian troops patrolled the Finger 4-8 spurs but did not hold the heights they took control of on the south bank in numerous operations on August 29-30. The move gave Indians a strong situational advantage over Chinese positions. India is not in a hurry to vacate the crucial peaks unless there is verifiable action leading to de-induction of PLA troops.

However, sources from Tuesday’s meeting said the discussions were reasonably positive. “The understanding is to keep the situation stable until agreement on disengagement is reached for which further rounds of talks have been proposed,” a source said. In future talks, both sides will get an opportunity to test intentions and ability to follow through on their decisions.

The joint statements need to be followed by actions that reduce the dangerous proximity of Indian and Chinese troops and there is uncertainty whether the statements signed off by China’s foreign ministry have the requisite political sanction at the top level. Indian sources are unclear if the mismatch between Chinese statements and actions are a plan or reflect contrary impulses in China’s political system.

What is evident is that India is taking nothing for granted even if the joint statements reduce, even if not eliminate, the possibility of conflict.

<https://timesofindia.indiatimes.com/india/joint-statements-aimed-at-lac-standstill/articleshow/78286646.cms>

Thu, 24 Sept 2020

LUH performance during recent himalayan trials was exceptional: Arup Chatterjee

By Anantha Krishnan M

The Light Utility Helicopter (LUH) from Hindustan Aeronautics Ltd (HAL) recently completed the high altitude trials in the Himalayas. During these 10-day extensive trials, the helicopter underwent several tests under extreme weather conditions.



Arup Chatterjee, Director (Engineering and R&D), HAL is part of the company since 1982

Arup Chatterjee, Director (Engineering, Research & Development), HAL, in an interview told Onmanorama, that LUH demonstrated the required performances and payload capabilities, and even exceeded the user expectations operating under stringent environment.

“LUH’s performance during the recent trials has been exceptional. Due to aerodynamic improvements implemented, the performance was far better when compared to last year’s trials at Leh,” said Arup. Excerpts:

Q: What were the challenges faced by the team as the project evolved?

A: Any new R&D project faces various challenges in spite of having the best of design tools and skill sets. LUH is no exception. Any helicopter design is a complex job. We indigenously designed two most critical systems – rotors and transmission, which are different from that of Advanced Light Helicopter and Light Combat Helicopter. The rotors had two-segment blade concept, being tried out for the first time in India. We had challenges in tooling and process stabilization to realize the main rotor blades with as many as 21 iterations.

On the gearbox, we had to overcome many design and manufacturing issues by replacing foreign items with indigenous ones. We developed it ourselves and in some cases jointly did it with the private sector.

Q. What are these items made in India?

A: The oil cooler fan quill shaft was from a source in the UK and it was replaced by our own in-house fabrication. The ring gear was from a source in the UK again and it was replaced by gears manufactured by Shanti Gears, Coimbatore.

Similarly, the MGB (main gearbox) housing has been manufactured by Microtek, Hyderabad and the tail rotor shaft has been manufactured by MTAR and Sumek, both based out of Hyderabad.

Q: How critical was the recent high-altitude trials?

A: High altitude environment coupled with hot weather (around 26 to 28 deg C) between July-Sept in Himalayas are considered stringent for the performance of helicopters. The challenges at such high altitudes are in terms of temperature, pressure, wind speeds and visibility – all of which can vary anytime impacting the performance of the helicopter.

The maximum payload capability (the maximum useful load that can be carried by the helicopter at highest altitudes) is a critical parameter and every kilogram matters. The helicopter needs to have adequate engine power and rotor capability to overcome these challenges and still deliver the payload.

In addition, the helicopter must land and take off from small helipads which require good hover capability, rudder margins and piloting skills.

The LUH was flown to various high altitude bases in Siachen Glacier by pilots of Indian Air Force and Indian Army and they are satisfied with the performance of the helicopter and its systems.

Q What is the present status of the project?

A: We have made three prototypes for development flight testing and certification activities. We also built a specific Ground Test Vehicle (helicopter clamped to ground) to carry out endurance runs and system checks before undertaking flight testing.

First flight of first prototype (PT-1) was carried out on September 6, 2016, the second prototype (PT-2) had its maiden flight on May 22, 2017 and third prototype (PT-3) took to the skies on December 14, 2018. Presently, all three prototypes have completed about 600 hours of flight testing.

Certification activities involving extensive ground testing and flight testing have been completed in Bengaluru. Outstation trials for assessing the performance of the helicopter and systems under hot weather, cold weather, sea level and hot weather and high altitudes, have also been completed. The IOC for IAF version was accorded during DefExpo at Lucknow this year. We are confident that the IOC from Army also will come soon.

The basic version of LUH will be integrated with role and optional equipment such as rescue hoist, cargo hook, emergency floats among others. The helicopter can be used for reconnaissance and surveillance, troop transport, search and rescue, casualty evacuation and scout.

Q: When will LUH production begin?

The issuance of IOC by the Centre for Military Airworthiness and Certification (CEMILCA) paves the way for launch of production. We have requested the IAF and Army to initiate the process of AoN (Acceptance of Necessity) to enable HAL to commence production.

The process of AoN, issuing RFP (Request for Proposal), technical evaluation, commercial evaluation, price negotiation and placement of order has a lead time of two to three years. We hope everything will fall in place soon with the successful completion of trials.

To start with, we can produce minimum 30 to 40 LUHs per year at our upcoming facility in Tumkur in Karnataka.

Q: Can a civil version of LUH be developed by HAL?

A: We have made extensive study to assess the market potential of LUH in civil applications. We found great potential for LUH in India and overseas in the next 10 to 15 years.

Keeping this in view, we have made a concept paper and forwarded to Ministry of Civil Aviation for possibility of upfront funding. If concurred, we can develop and certify the LUH with civil certified equipment and system within a time span of four to five years.

We have made formal application to DGCA for taking up design and development of LUH civil version in this regard.

<http://www.indiandefensenews.in/2020/09/luh-performance-during-recent-himalayan.html>

Fri, 25 Sept 2020

SAAB calls India's new defence FDI model "very attractive", seeks more clarity on Strategic Partnership model

In a virtual interaction with the media persons Mats Palmberg, Head of SAAB's Gripen India campaign, said his company is planning to set up an advanced industrial body, the Indian Aircraft Company (INAC)

By Huma Siddiqui

Swedish defence company SAAB, terming the 74 per cent Foreign Direct Investment (FDI) in defence "a very attractive model", has sought clarity if the Strategic Partnership (SP) model of the Defence Procurement Procedure (DPP) comes under it.

In a virtual interaction with the media persons Mats Palmberg, Head of SAAB's Gripen India campaign, said his company is planning to set up an advanced industrial body, the Indian Aircraft Company (INAC). "If the Gripen fighter is selected by the Indian Air Force (IAF) in the 114 fighter tender which is underway, then INAC will be set up." "This will enable the Original Equipment Manufacturers (OEM) have control over the setup and they can take responsibility and also meet customer expectations."



According to the Head of the Gripen's India Campaign, there are still some issues including Liability Issue that needs to be clarified in the SP Model.

Responding to a question, Mr Palmberg "The 74 per cent is a very attractive model. There is no clarity if Chapter 7 comes under it; we need some clarity on this." To promote the private industry, SP Model comes under Chapter 7 in the DPP.

According to the Head of the Gripen's India Campaign, there are still some issues including Liability Issue that needs to be clarified in the SP Model. Adding, "The OEM should have a bigger stake. This is better but this need not be for forever."

Said Eva Soderstrom, Head of Industrial Cooperation, "The latest Gripen E and also Gripen F which is a twin-seater variant under development has been offered by SAAB to the IAF."

What is INAC?

According to Mr Palmberg "This is a dual-track proposal. The first part is related to the Gripen fighter aircraft, The second part deals with the technological support to the indigenous fighter programmes like the Light Combat Aircraft (LCA)-MK2 and Advanced Medium Combat Aircraft (AMCA) which is currently under development.

This will be an industrial hub which the Swedish Company is planning where from manufacturing, delivery, maintenance, refit and overhaul (MRO) all will be undertaken there. Also, the design capability will be used for further improvements.

"We don't want the aircraft to go all the way to Sweden at any point for overhauling or anything," he said.

Update

Evaluation is going of the proposals which have been submitted by global aerospace giants for 114 aircraft proposal.

Once the specifications are finalized, it will be sent to the Defence Acquisition Council (DAC), for the Acceptance of Necessity (AoN). This will be followed by the issuance of Request for Proposal (RFP).

While the Swedish Company is looking at a partnership Hindustan Aeronautics Limited (HAL) in the INAC including as an equity partner, it is also open for partnerships with the private sector companies and DPSUs.

<https://www.financialexpress.com/defence/saab-calls-indias-new-defence-fdi-model-very-attractive-seeks-more-clarity-on-strategic-partnership-model/2090558/>



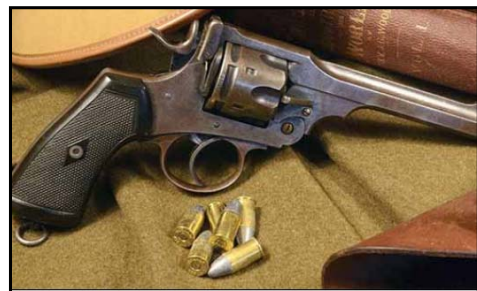
Fri, 25 Sept 2020

Webley & Scott, the iconic British gun manufacturing firm, to set up new unit in UP's Hardo

Webley & Scott (W&S), the iconic British firearms manufacturing company, will soon set up its gun production unit in Uttar Pradesh.

According to reports, Webley & Scott's new unit will be set up in the Hardoi district and it will become functional from November. This will also be the first foreign company to manufacture firearms in India.

Webley & Scott, which armed the Allied forces during the two World Wars and produced weapons for at least 15 countries, will now mark its presence in the Indian subcontinent with the new unit in Sandila (Hardoi), barely 30 km from Lucknow.



The handgun manufacturing giant has joined hands with Lucknow-based Sial Manufacturers Pvt Ltd for the project and will begin operations with the production of revolvers. The new unit will manufacture its .32 revolver in the first phase.

Joginder Pal Singh Sial of Sial Manufacturers, the all-India distributor of W&S products, said, "The government's support and the Centre's 'Make in India' policy helped the project take final shape."

He further said, "The cost of the .32 revolver will be Rs 1.6 lakh. We will give stiff competition to the arms manufactured by ordnance factories. People will now get world-class weapons at their doorsteps."

According to the government spokesman, John Bright, the co-owner of Webley & Scott has said that they would later manufacture pistols, airguns, shotgun and ammunition as well.

"We decided to invest in India and in the state of Uttar Pradesh keeping in view the vast market potential. The idea to expand our business got shape after discussions with the Sial family in 2018. We entered a new joint venture for the manufacture of firearms and airguns in India for the Indian domestic market. We got the licence to manufacture firearms in India in 2019," said Bright in a statement.

He said the original design of the Mark IV .32 pistol of 1899 would be used to cater to the Indian market in the first phase.

<https://www.defencenews.in/article/Webley-and-Scott,-the-iconic-British-gun-manufacturing-firm,-to-set-up-new-unit-in-UP%e2%80%99s-Hardoi-962343>

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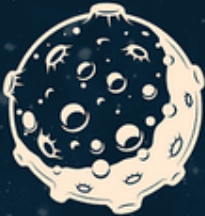
Fri, 25 Sept 2020

India set to visit low Earth orbit on December 2021 via ISRO's first manned space mission, Gaganyaan

Two unmanned flights and one manned flight will be part of the Gaganyaan programme. It is aimed at accelerating research and development in science and technology domains, and will also enable India to participate in future global space exploration missions

By Shreya Ganguly Edited By Megha Reddy

Over the years, the Indian Space Research Organisation (ISRO) has achieved many milestones. Started in 1969, the space agency of the Government of India has put the country on the world map among the top space agencies. After conducting successful missions such as Mars Orbiter Mission, Chandrayaan 1 and Chandrayaan 2 among others, ISRO is pushing the boundaries in space science with every mission. With an aim to make India reach new heights in the global space economy, ISRO is now gearing up for the launch of India's maiden human spaceflight, Gaganyaan. The Gaganyaan programme is aimed towards opening up opportunities for research and development in science and technology.

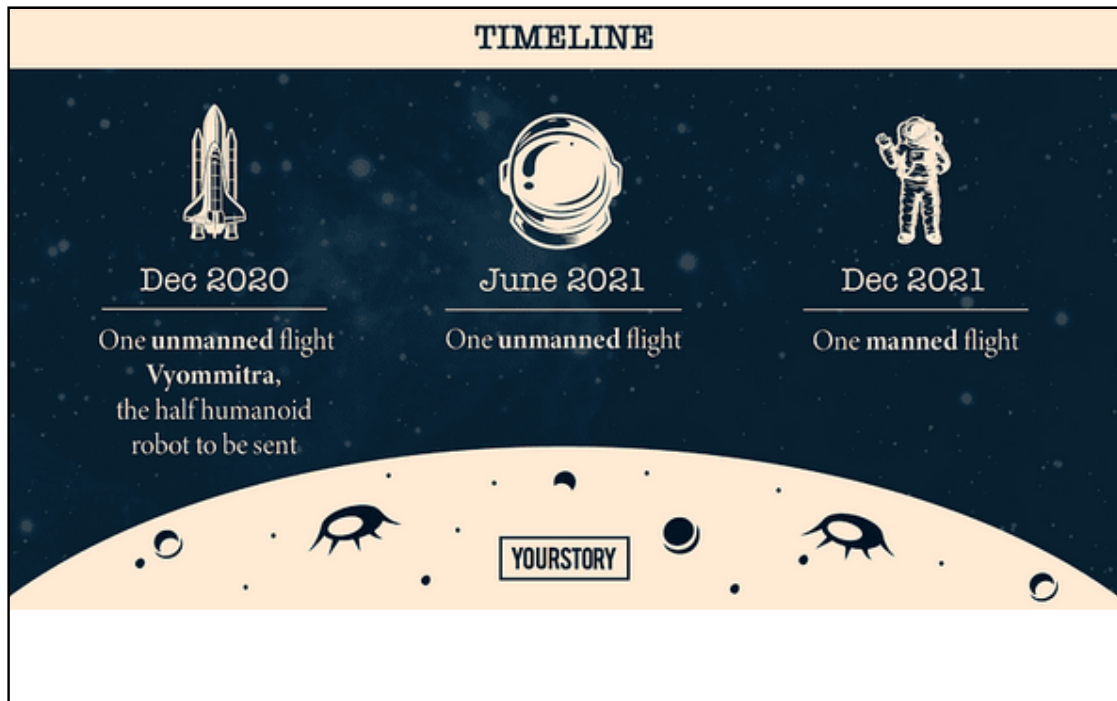
KEY FACTS		
Three	Rs 9,023 Cr	5 to 7 days
No. of crew members to go on the manned mission	Cost of programme	Duration of the mission
	Aim of Mission To open opportunities for research and development in science and technology in areas such as:	
	Medicine Agriculture Industrial safety Pollution Waste management	
	Water Food resource management	

Addressing the audience digitally during the International Space Conference on ‘Ushering the New Era for Indian Space Sector’, Dr Unnikrishnan Nair S, Director of Human Space Flight Centre, said, “ISRO seeks national and international collaborations for working in some of the areas for the Gaganyaan programme.”

Significance of Gaganyaan programme

According to an official statement by the Union Cabinet, the Gaganyaan project is a “national effort”, which will involve participation from industry, academia, and national agencies across

India. The statement also revealed that two unmanned flights and one manned flight will be undertaken as part of the mission. Several reports revealed that ISRO had plans to launch its first unmanned flight in December 2020, its second unmanned flight in June 2021, and the final manned spacecraft was scheduled to be launched in December 2021.



In June this year, Lok Sabha minister Dr Jitendra Singh announced that the Gaganyaan project will not be affected due to the pandemic and the preparations needed to meet the deadline is moving forward accordingly. However, media reports from August quoting unnamed sources revealed that the launch of unmanned flight this December is likely to be delayed due to COVID-19.

“The programme is expected to spur research and development within the country in niche science and technology domains. The human spaceflight programme will provide a unique micro-gravity platform in space for conducting experiments and a test bed for future technologies,” the official statement noted.

ISRO is also looking at significant potential for technology spinoffs in several areas such as medicine, agriculture, industrial safety, pollution, waste management, water and food resource management through this programme. The maiden spaceflight is also aiming to achieve economic activities such as employment generation, human resource development, and enhanced industrial capabilities. Gaganyaan is also aimed at enabling India to participate as a collaborating partner in future global space exploration activities.

“Gaganyaan Programme will establish a broader framework for collaboration between ISRO, academia, industry, national agencies, and other scientific organisations. It will allow pooling of diverse technological and industrial capabilities and enable broader participation in research opportunities and technology development benefitting large numbers of students and researchers. It will also inspire a large number of young students to take up science and technology careers for national development,” the statement said.

The Gaganyaan Programme, approved by the Union Cabinet in December 2018, will carry three crew members to low earth orbit — orbit within the altitude of 160 to 2000 kms or less — on a five to seven days mission. “The total fund requirement for the Gaganyaan Programme is within Rs 10,000 crore (Rs 9023 crores) and includes cost of technology development, flight hardware realisation, and essential infrastructure elements,” the Cabinet said in a statement.

Technical efforts beyond Gaganyaan

A human rated GSLV Mk-III (Geosynchronous Satellite Launch Vehicle) will be used for carrying the orbital module. According to the statement, ISRO has already completed the development of the launch vehicle named GSLV Mk-III X and has necessary payload capability to launch a three-member crew module in the low earth orbit.

This three-stage heavy lift launch vehicle, named GSLV MkIII-M1, was used for launching Chandrayaan-2. During the space conference, Dr VR Lalithambika, Director of ISRO Human Spaceflight Programme, said, while ISRO received a lot of interest from citizens to participate in the maiden spaceflight, but due to protocols, the first programme needs experienced air force pilots to be part of the mission. Later on, people from other fields such as entrepreneurs, researchers, academia, and innovators will also get the opportunity to participate in manned space missions.

Meanwhile, Dr Unnikrishnan added that the selected four air force pilots for the maiden flight are currently undergoing basic training in GCTC (Yuri Gagarin Cosmonaut Training Centre) in Russia and will return to India in March next year for specific training using simulators. After returning to India, the pilots will have to undergo three main parts to the training - a module on the overall project, a module for crew members, and a module on the flight hardware and software.

Apart from this, ISRO has also developed a female half humanoid robot named Vyommitra, a combination of two Sanskrit words Vyoma (space) and Mitra (friend), which will be sent on the first unmanned Gaganyaan flight, scheduled for December this year. While introducing Vyommitra in January during the inaugural session of 'Human Spaceflight and Exploration - Present Challenges and Future Trends', Dr Sivan explained that Vyommitra will help in simulating human functions in space and will also interact with the environment control life support system. According to the space agency, Vyommitra has been designed to speak in Hindi and English, can act as a companion to the astronauts, converse with them, and also respond to their queries.

Current status

Dr Unnikrishnan revealed that Gaganyaan is in its testing phase. According to media reports, ISRO will have to successfully complete three major tests - 1) air drop test for the parachute system to check the ability for successfully recovering an orbiting space capsule; 2) flight of the test vehicle; and 3) abort test to ensure escape of the crew in case of an emergency at the launch pad. These tests need to be done before the launch of the unmanned flight.

Further, he said that ISRO has shortlisted six experiments from a total of 28 proposals, which will be carried out under the Gaganyaan mission. Dr Unnikrishnan said that in future, the human spaceflight missions will also be expanded for exploration of other planets and moon, and for this, ISRO will join hands with industry players and academia to develop several technologies such as construction in space, tele-robotics, and artificial intelligence. If the maiden human spaceflight Gaganyaan mission is a success next year, India will become the fourth country to have conducted human spaceflights after the US, Russia, and China.

<https://yourstory.com/2020/09/india-low-earth-orbit-gaganyaan-isro>

Optimizing of VCSEL photon lifetime for minimum energy consumption at varying bit rates

The explosive growth of internet use leads to an explosion of the energy consumption of data centers. Vertical cavity surface emitting lasers (VCSELs) are key enabling devices meeting the requirements of optical interconnects in such data centers up to a few hundred meters of single or multimode fiber due to their simplicity, low cost, and large data transmission rates. Achieving higher bit rates has been the stated goal of research and development during the last years.

The next challenge will be to focus on reducing the energy consumption of the lasers and drivers—a function of the bit rate. The energy cost of transmission at potentially the largest possible bit rates, use of predistortion or forward error correction needs to be compared with the energy cost of data transmission and device life time at lower bit rates. Finally, end of life considerations of the total cost of data centers will move the focus of operators of such centers.



Credit: CC0 Public Domain

Recently, Prof. Bimberg's group at Bimberg Chinese-German Center for Green Photonics Changchun at Institute of Optics, Fine Mechanics,

and Physics, Chinese Academy of Sciences has developed VCSELs emitting at 850 nm, 880 nm, 910 nm, 940 nm, which were optimized to achieve 50+ Gb/s, enabling 200+ Gb/s data transmission across a multimode fiber. This was based on the PAM2-modulation scheme without any kind of predistortion leading to a spectral efficiency around 2 bit.

Furthermore, by optimization of the maximum bit rate of a system, the device lifetime, and the system's energy consumption, this group has demonstrated that 200 Gb/s transmission also can be achieved by using eight lasers with 25 Gb/s each. At 25 Gb/s EDR is even lower than 100 fJ/bit, presenting a 75% reduction as compared to the 50 Gb/s values. For the same BR of 200 Gb/s 50% energy reduction is achieved, although the number of devices has been doubled. In addition, the current density at operating conditions is reduced by 60% and risk of device failure is reduced.

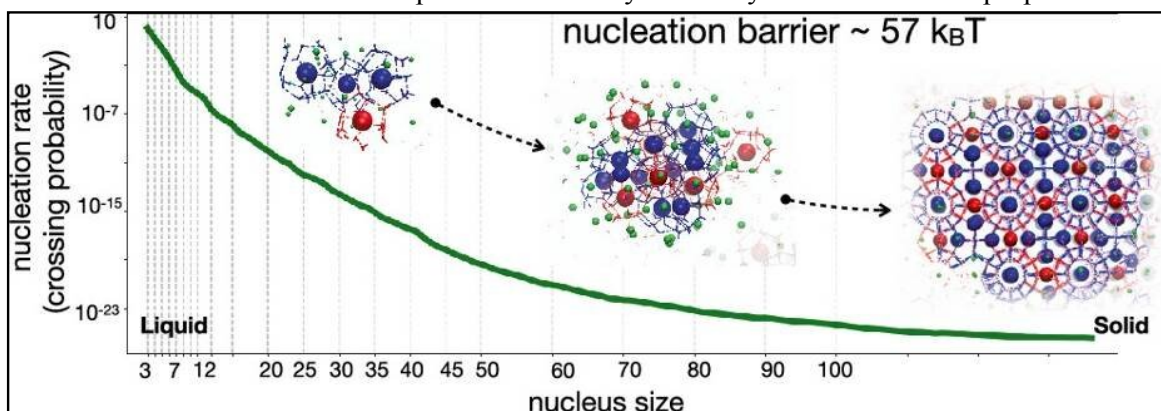
Longer device lifetime together with the reduction total energy consumption by 50% will overcompensate the cost of doubling the number of devices. Lower power consumption leads to less heat, and temperature induced roll-over of the output power occurs at larger currents. Finally, less energy for cooling needs to be provided. Thus, the end of life cost is increased dramatically by choosing two lasers at a medium bit rate instead of one laser operating at maximum technically possible bit rate.

More information: Gunter Larisch et al, Optimization of VCSEL photon lifetime for minimum energy consumption at varying bit rates, *Optics Express* (2020). DOI: [10.1364/OE.391781](https://doi.org/10.1364/OE.391781)

Journal information: [Optics Express](https://phys.org/news/2020-09-optimizing-vcsel-photon-lifetime-minimum.html)
<https://phys.org/news/2020-09-optimizing-vcsel-photon-lifetime-minimum.html>

Rate prediction for homogeneous nucleation of methane hydrate

Methane hydrates are the single biggest source of fossil fuel on planet earth and play a role in climate change. The molecular process of their formation is not known and heavily debated. In a paper in the *Journal of Physical Chemistry B*, researchers at the Van 't Hoff Institute for Molecular Sciences (HIMS) now provide insight in methane hydrate formation. They performed atomistic scale molecular simulations that help establish the key thermodynamic and kinetic properties.



Credit: HIMS

Mixtures of methane gas and water can spontaneously form a solid hydrate. Such methane hydrates naturally occur in abundance at the ocean floors and in permafrost, exceeding the natural gas reserve substantially. As such, methane hydrates are envisioned not only as a future energy resource but also as very relevant for global climate change.

The crystallization of methane hydrates via homogeneous nucleation under natural, moderate conditions is of both industrial and scientific relevance, yet still poorly understood. Predicting the nucleation rates at such conditions is notoriously difficult due to high nucleation barriers, and requires, besides an accurate molecular model, enhanced sampling.

Crystal nucleation rate

Employing the efficient transition interface sampling technique, Arjun Wadhawan and Peter Bolhuis of the HIMS research group Computational Chemistry now predict the exact rate of nucleation with an accurate atomistic force field, focusing on specific conditions of 280 K and 500 bar. They computed a crystal nucleation rate of a few hundred nuclei per second per cm^3 . This figure is in agreement with experimental estimates for nearby conditions, although this is most likely fortuitous as the predictions are very sensitive to the precise simulation setup. Nevertheless, the work shows that it is now possible to compute rates for methane hydrates at moderate supersaturation, without relying on any assumptions other than the force field. This will assist future research aiming at understanding natural hydrates, improving materials synthesis, and developing dissolving strategies.

More information: A. Arjun et al. Rate Prediction for Homogeneous Nucleation of Methane Hydrate at Moderate Supersaturation Using Transition Interface Sampling, *The Journal of Physical Chemistry B* (2020). DOI: [10.1021/acs.jpcc.0c04582](https://doi.org/10.1021/acs.jpcc.0c04582)

Journal information: *Journal of Physical Chemistry B*

<https://phys.org/news/2020-09-homogeneous-nucleation-methane-hydrate.html>

The return of the spin echo

By Florian Aigner

A research team from Garching and Vienna discovered a remarkable echo effect that offers exciting new possibilities for working with quantum information.

Small particles can have an angular momentum that points in a certain direction—the spin. This spin can be manipulated by a magnetic field. This principle, for example, is the basic idea behind magnetic resonance imaging as used in hospitals. An international research team has now discovered a surprising effect in a system that is particularly well suited for processing quantum information: the spins of phosphorus atoms in a piece of silicon, coupled to a microwave resonator. If these spins are cleverly excited with microwave pulses, a so-called spin echo signal can be detected after a certain time—the injected pulse signal is re-emitted as a quantum echo. Surprisingly, this spin echo does not occur only once, but a whole series of echoes can be detected. This opens up new possibilities of how information can be processed with quantum systems.

The experiments were carried out at the Walther-Meissner-Institute in Garching by researchers from the Bavarian Academy of Sciences and Humanities and the Technical University of Munich, the theoretical explanation was developed at TU Wien (Vienna). Now the joint work has been published in the journal *Physical Review Letters*.

The echo of quantum spins

"Spin echoes have been known for a long time, this is nothing unusual," says Prof. Stefan Rotter from TU Wien (Vienna). First, a magnetic field is used to make sure that the spins of many atoms point in the same magnetic direction. Then the atoms are irradiated with an electromagnetic pulse, and suddenly their spins begin to change direction.

However, the atoms are embedded in slightly different environments. It is therefore possible that slightly different forces act on their spins. "As a result, the spin does not change at the same speed for all atoms," explains Dr. Hans Hübl from the Bavarian Academy of Sciences and Humanities. "Some particles change their spin direction faster than others, and soon you have a wild jumble of spins with completely different orientations."

But it is possible to rewind this apparent chaos—with the help of another electromagnetic pulse. A suitable pulse can reverse the previous spin rotation so that the spins all come together again. "You can imagine it's a bit like running a marathon," says Stefan Rotter. "At the start signal, all the runners are still together. As some runners are faster than others, the field of runners is pulled further and further apart over time. However, if all runners were now given the signal to return to the start, all runners would return to the start at about the same time, although faster runners have to cover a longer distance back than slower ones."

In the case of spins, this means that at a certain point in time all particles have exactly the same spin direction again—and this is called the spin echo. "Based on our experience in this field, we had already expected to be able to measure a spin echo in our experiments," says Hans Hübl. "The remarkable thing is that we were not only able to measure a single echo, but a series of several echoes."

The spin that influences itself

At first, it was unclear how this novel effect comes about. But a detailed theoretical analysis now made it possible to understand the phenomenon: It is due to the strong coupling between the two components of the experiment—the spins and the photons in a microwave resonator, an



Credit: C. Hohmann / MCQST

electrical circuit in which microwaves can only exist at certain wavelengths. "This coupling is the essence of our experiment: You can store information in the spins, and with the help of the microwave photons in the resonator you can modify it or read it out," says Hans Hübl.

The strong coupling between the atomic spins and the microwave resonator is also responsible for the multiple echoes: If the spins of the atoms all point in the same direction in the first echo, this produces an electromagnetic signal. "Thanks to the coupling to the microwave resonator, this signal acts back on the spins, and this leads to another echo—and on and on," explains Stefan Rotter. "The spins themselves cause the electromagnetic pulse, which is responsible for the next echo."

The physics of the spin echo has great significance for technical applications—it is an important basic principle behind magnetic resonance imaging. The new possibilities offered by the multiple echo, such as the processing of quantum information, will now be examined in more detail. "For sure, multiple echos in spin ensembles coupled strongly to the photons of a resonator are an exciting new tool. It will not only find useful applications in quantum information technology, but also in spin-based spectroscopy methods," says Rudolf Gross, co-author and director of the Walther-Meissner-Institute.

More information: Stefan Weichselbaumer et al. Echo Trains in Pulsed Electron Spin Resonance of a Strongly Coupled Spin Ensemble, *Physical Review Letters* (2020). DOI: [10.1103/PhysRevLett.125.137701](https://doi.org/10.1103/PhysRevLett.125.137701)

Journal information: [Physical Review Letters](https://phys.org/news/2020-09-echo.html)
<https://phys.org/news/2020-09-echo.html>



Fri, 25 Sept 2020

SLAC invention could make particle accelerators 10 times smaller

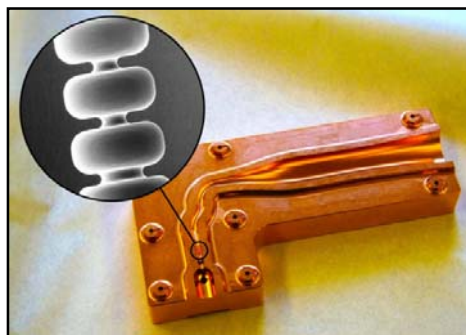
by Manuel Gnida

Particle accelerators generate high-energy beams of electrons, protons and ions for a wide range of applications, including particle colliders that shed light on nature's subatomic components, X-ray lasers that film atoms and molecules during chemical reactions and medical devices for treating cancer.

As a rule of thumb, the longer the accelerator, the more powerful it is. Now, a team led by scientists at the Department of Energy's SLAC National Accelerator Laboratory has invented a new type of accelerator structure that delivers a 10 times larger energy gain over a given distance than conventional ones. This could make accelerators used for a given application 10 times shorter.

The key idea behind the technology, described in a recent article in *Applied Physics Letters*, is to use terahertz radiation to boost particle energies.

In today's accelerators, particles draw energy from a radio-frequency (RF) field fed into specifically shaped accelerator structures, or cavities. Each cavity can deliver only a limited energy boost over a given distance, so very long strings of cavities are needed to produce high-energy beams.



SLAC scientists have invented a copper accelerator structure that could make future X-ray lasers and accelerators for radiation therapy more compact. It feeds terahertz radiation into a tiny cavity to boost particles to tremendous energies. This image shows one half of the structure with the cavity in the circled area. Inset: Scanning electron microscope image of a section of the cavity, which is 3.5 millimeters long and 280 microns wide at its narrowest point. Credit: Chris Pearson/Emilio Nanni/SLAC National Accelerator Laboratory

Terahertz and radio waves are both electromagnetic radiation; they differ in their respective wavelengths. Because terahertz waves are 10 times shorter than radio waves, cavities in a terahertz accelerator can also be much smaller. In fact, the one invented in this study was only 0.2 inches long.

One major challenge to building these tiny cavity structures is to machine them very precisely. Over the past few years, SLAC teams developed a way to do just that. Instead of using the traditional process of stacking many layers of copper on top of each other, they built the minute structure by machining two halves and bonding them together.

The new structure also produces particle pulses a thousand times shorter than those coming out of conventional copper structures, which could be used to produce beams that pulse at a higher rate and unleash more power over a given time period.

Next, the researchers are planning to turn the invention into an electron gun—a device that could produce incredibly bright beams of electrons for discovery science, including next-generation X-ray lasers and electron microscopes that would allow us to see in real time how nature works on the atomic level. These beams could also be used for cancer treatment.

Delivering on this potential also requires further development of sources of terahertz radiation and their integration with advanced accelerators, such as the one described in this study. Because terahertz radiation has such a short wavelength, its sources are particularly challenging to develop, and there is little technology available at present. SLAC researchers are pursuing both electron beam and laser-based terahertz generation to provide the high peak powers needed to turn their accelerator research into future real-world applications.

More information: Mohamed A. K. Othman et al, Experimental demonstration of externally driven millimeter-wave particle accelerator structure, *Applied Physics Letters* (2020). [DOI: 10.1063/5.0011397](https://doi.org/10.1063/5.0011397)

Journal information: [Applied Physics Letters](https://doi.org/10.1063/5.0011397)
<https://phys.org/news/2020-09-slac-particle-smaller.html>



Fri, 25 Sept 2020

Gravity causes homogeneity of the universe

by Pia Gärtner

Gravity can accelerate the homogenization of space-time as the universe evolves. This insight is based on theoretical studies of the physicist David Fajman of the University of Vienna. The mathematical methods developed within the research project allow to investigate fundamental open questions of cosmology such as why the universe today appears so homogeneous. The results have been published in the journal *Physical Review Letters*.

The temporal evolution of the universe, from the Big Bang to the present, is described by Einstein's field equations of general relativity. However, there are still a number of open questions about cosmological dynamics, whose origins lie in supposed discrepancies between theory and observation. One of these open questions is: Why is the universe in its present state so homogeneous on large scales?

From the Big Bang to the present

It is assumed that the universe was in an extreme state shortly after the Big Bang, characterized in particular by strong fluctuations in the curvature of spacetime. During the long process of expansion, the universe then evolved towards its present state, which is homogeneous and isotropic on large scales—in simple terms: the cosmos looks the same everywhere.

This is inferred, among other things, from the measurement of the so-called background radiation, which appears highly uniform in every direction of observation. This homogeneity is

surprising in that even two regions of the universe that were causally decoupled from each other—i.e., they could not exchange information—still exhibit identical values of background radiation.

Alternative theories

To resolve this supposed contradiction, the so-called inflation theory was developed, which postulates a phase of extremely rapid expansion immediately after the Big Bang, which in turn can explain the homogeneity in the background radiation.

However, how this phase can be explained in the context of Einstein's theory requires a number of modifications of the theory, which seem artificial and cannot be verified directly.

New findings: Homogenization by gravitation

Up to now, it was not clear whether the homogenization of the universe can be explained completely by Einstein's equations. The reason for this is the complexity of the equations and the associated difficulty to analyze their solutions—models for the universe—and to predict their behavior.

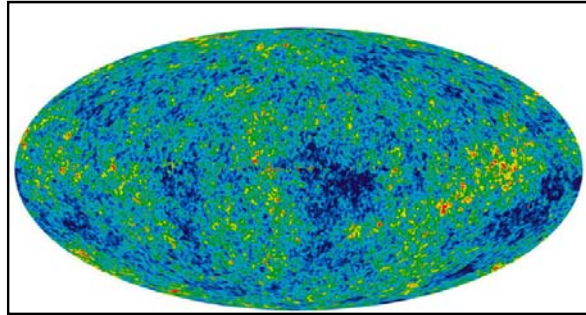
In the concrete problem, the time evolution of the originally strong deviations from the homogeneous state as cosmological gravitational waves has to be analyzed mathematically. It has to be shown that they decay in the course of the expansion thus allowing the universe to get its homogeneous structure.

Such analyses are based on modern mathematical methods in the field of geometric analysis. Until now, these methods could only achieve such results for small deviations from the homogeneous space-time geometry. David Fajman from the University of Vienna has now succeeded for the first time to transfer these methods to the case of arbitrarily large deviations.

The results published in the renowned journal PRL show that homogenization in the investigated class of models is already completely explained by Einstein's theory and does not require any additional modifications. If this finding can be transferred to more general models, it means that it does not necessarily need a mechanism like inflation to explain the state of our present universe, but that Einstein's theory could finally triumph once again.

More information: David Fajman. Future Attractors in 2+1 Dimensional Λ Gravity, *Physical Review Letters* (2020). [DOI: 10.1103/PhysRevLett.125.121102](https://doi.org/10.1103/PhysRevLett.125.121102)

Journal information: *Physical Review Letters*
<https://phys.org/news/2020-09-gravity-homogeneity-universe.html>



During its expansion, the universe evolved towards its present state, which is homogeneous and isotropic on large scales. This is inferred, among other things, from the measurement of the so-called background radiation as nicely seen in the full sky image of the WMAP data. New results published in the renowned journal PRL show that homogenization in the investigated class of cosmological models is already completely explained by Einstein's theory of gravity and does not require any additional modifications. Credit: NASA / WMAP Science Team

Scientists take a 'spin' onto magnetoresistive RAM

By Nthu Mse

Magnetoresistive random access memory (MRAM) is the top candidate for next-generation digital technology. However, manipulating MRAM efficiently and effectively is challenging. An interdisciplinary research team based at National Tsing Hua University (NTHU) in Taiwan, led by Prof. Chih-Huang Lai, Department of Materials Science and Engineering, and Prof. Hsiu-Hau Lin, Department of Physics has now achieved a breakthrough. By adding a layer of platinum only a few nanometers thick, their device generates spin current to switch the pinned magnetic moments at will—a task that has never been accomplished before. For faster reading and writing, reduced power consumption and retaining data through a power outage, MRAM is particularly promising.



The sputtering technique has been widely used for thin film deposition. Under the sputtering guns, an eight-inch wafer with patterned device fabricated by deposition, photolithography, etching, etc. is shown. Credit: NTHU MSE, Taiwan

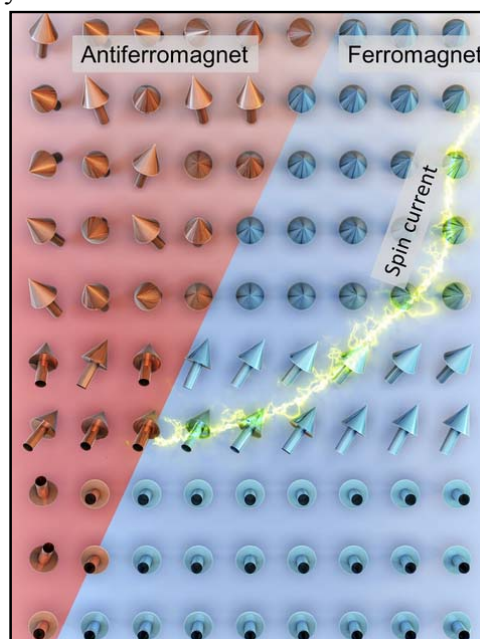
At present, information processing in digital devices is mainly carried out using dynamic random access memory (DRAM), but it consumes significant power and faces serious hurdles when reduced in size. DRAM uses the charge of electrons. "But electrons have both charge and spin," Lai said. "Why can't one work with electron spin to manipulate MRAM?" To put the idea into practice, Lai and Lin formed an interdisciplinary research team with doctoral students Bohong Lin and Boyuan Yang.

Lin explained that the structure of MRAM is like a sandwich. The upper layer consists of a freely flipping magnet, used for data computation, while the bottom layer consists of a fixed magnet, responsible for data storage. These two layers are separated by an oxide layer.

The challenge is to switch these layers by electrical means. After a long series of experiments, they found success with a nanometer-thin layer of platinum. Due to spin-orbit interactions, the electric current drives the collective motion of electron spins first. The spin current then switches the pinned magnetic moment effectively and precisely.

In recent years, NTHU has been promoting cross-disciplinary cooperation, such as the MRAM research conducted by the materials expert Lai and the physicist Lin.

Major international companies are pursuing MRAM technology, including TSMC, Intel, and Samsung. It's likely that mass production of high-density MRAM will begin sometime this year, a development where the research team led by Lai and Lin has played a key role.



A spin current (the yellow electric-like path) passes through the ferromagnetic (FM, blue region)/antiferromagnetic (AFM, red region) bilayer structure (the arrows mean the magnetic moment direction). The ferromagnetic moment and antiferromagnetic moment (the exchange bias) can both be switched (middle part: switching; upper part: already switched; lower part: to be switched). Credit: NTHU MSE, Taiwan

The research team is currently extending their groundbreaking discovery to other structures, and their findings are expected to have major impacts on the development of memory technology. In Lai's view, the development of MRAM technology is going to have a decisive influence on the future growth and evolution of the world's semiconductor industry.

More information: Po-Hung Lin et al. Manipulating exchange bias by spin-orbit torque, *Nature Materials* (2019). DOI: [10.1038/s41563-019-0289-4](https://doi.org/10.1038/s41563-019-0289-4)

Journal information: *Nature Materials*
<https://phys.org/news/2020-09-scientists-magneto-resistive-ram.html>

COVID-19 Research News

TIMESNOWNEWS.COM

Fri, 25 Sept 2020

Fast, cheap, yet accurate COVID-19 test developed by researchers

This makes the method particularly attractive for places and situations with limited resources. It is equally interesting for repeated testing and for moving resources from expensive diagnostics to other parts

Stockholm: A team of researchers has developed a method for fast, cheap, yet accurate testing for COVID-19 infection. The method simplifies and frees the testing from expensive reaction steps, enabling upscaling of the diagnostics.

This makes the method particularly attractive for places and situations with limited resources. It is equally interesting for repeated testing and for moving resources from expensive diagnostics to other parts of the care chain. The study led by researchers at the Karolinska Institutet was published in the journal *Nature Communications*.

"We started working on the issue of developing a readily available testing method as soon as we saw the developments in Asia and southern Europe, and before the situation reached crisis point in Sweden," says principal investigator Bjorn Reinius, research leader at the Department of Medical Biochemistry and Biophysics at Karolinska Institutet. "Our method was effectively finished already by the end of April, and we then made all the data freely available online."

The spread of the new coronavirus at the end of 2019 in China's Wuhan region quickly escalated into a global pandemic. The relatively high transmission rate and a large number of asymptomatic infections led to a huge, worldwide need for fast, affordable, and effective diagnostic tests that could be performed in clinical as well as non-clinical settings.

Established diagnostic tests for COVID-19 are based on the detection of viral RNA in patient samples, such as nasal and throat swabs, from which RNA molecules must then be extracted and purified. RNA purification constitutes a major bottleneck for the testing process, requiring a great deal of equipment and logistics as well as expensive chemical compounds.



Fast, cheap, yet accurate COVID-19 test developed by researchers | Photo Credit: iStock Images

Making the current methods simpler without markedly compromising their accuracy means that more and faster testing can be carried out, which would help to reduce the rate of transmission and facilitate earlier-stage care.

The cross-departmental research group at Karolinska Institutet has now developed methods that completely circumvent the RNA-extraction procedure so that once the patient sample has been inactivated by means of heating, rendering the virus particles no longer infectious, it can pass straight to the diagnostic reaction that detects the presence of the virus.

According to the researchers, the most important keys to the method's success are both the above virus inactivation procedure and a new formulation of the solution used to collect and transport the sample material taken from the patients.

"By replacing the collection buffer with simple and inexpensive buffer formulations, we can enable viral detection with high sensitivity directly from the original clinical sample, without any intermediate steps," says Dr Reinius.

Institutions and research groups around the world have shown great interest in the method since a first version of the scientific article was published on the preprint server medRxiv. The article was read more than 15,000 times even before it was peer-reviewed by other researchers in the field and officially published in Nature Communications.

"Thanks to the low cost and the simplicity of the method, it becomes a particularly attractive option at sites and in situations with limited resources but a pressing need to test for COVID-19," he says and adds: "I would certainly like to see that this test used in Sweden too, for example for cheap periodic testing of asymptomatic people to eliminate the spread of infection."

<https://www.timesnownews.com/health/article/fast-cheap-yet-accurate-covid-19-test-developed-by-researchers/657295>

Business Standard

Fri, 25 Sept 2020

Chinese pharma company says Covid-19 vaccine to be ready by early 2021

A Chinese pharmaceutical company on Thursday said the coronavirus vaccine it is developing should be ready by early 2021 for distribution worldwide, including the United States

Beijing: A Chinese pharmaceutical company on Thursday said the coronavirus vaccine it is developing should be ready by early 2021 for distribution worldwide, including the United States.

Yin Weidong, the CEO of SinoVac, vowed to apply to the US Food and Drug Administration to sell CoronaVac in the United States if it passes its third and final round of testing in humans. Yin said he personally has been given the experimental vaccine.

At the very beginning, our strategy was designed for China and for Wuhan. Soon after that in June and July we adjusted our strategy, that is to face the world, Yin said, referring to the Chinese city where the virus first emerged.

Our goal is to provide the vaccine to the world including the US, EU and others, Yin said.

Stringent regulations in the US, European Union, Japan and Australia have historically blocked the sale of Chinese vaccines. But Yin said that could change.

SinoVac is developing one of China's top four vaccine candidates along with state-owned SinoPharm, which has two in development, and military-affiliated private firm CanSino.

More than 24,000 people are currently participating in clinical trials of CoronaVac in Brazil, Turkey, and Indonesia, with additional trials scheduled for Bangladesh and possibly Chile, Yin said.

SinoVac chose those countries because they all had serious outbreaks, large populations and limited research and development capacity, he said.

He spoke to reporters during a tour of a SinoVac plant south of Beijing. Built in a few months from scratch, the plant is designed to enable SinoVac to produce half a million vaccine doses a year. The bio-secure facility was already busy on Thursday filling tiny bottles with the vaccine and boxing them.

The company projects it will be able to produce a few hundred million doses of the vaccine by February or March of next year.

SinoVac is also starting to test small doses of CoronaVac on children in the three countries because of the high rate of infection among young people there.

Yin said the company would prioritize distribution of the vaccine to countries hosting human trials of CoronaVac.

While the vaccine has not yet passed the phase 3 clinical trials, a globally accepted standard, SinoVac has already injected thousands of people in China under an emergency use provision.

Yin said he was one of the first to receive the experimental vaccine months ago along with researchers after phase one and two of human trials showed no serious adverse effects. He said that self-injecting showed his support for CoronaVac.

This is kind of a tradition of our company, Yin said, adding that he had done the same with a hepatitis vaccine under development.

Earlier this year, China permitted emergency use of vaccine candidates for at-risk populations like border personnel and medical workers if companies could show good safety and good antibodies from tests of about 1,000 people, Yin said.

SinoVac received that approval in June along with SinoPharm and CanSino, and was able to provide tens of thousands of doses of CoronaVac to Beijing's municipal government, Yin said.

SinoVac employees qualified for emergency use of the vaccine because an outbreak inside the company would cripple its ability to develop a vaccine, he said.

About 90% of the company's staff have received it.

We are confident that our research of the COVID-19 vaccines can meet the standards of the US and EU countries, Yin said.

https://www.business-standard.com/article/international/chinese-pharma-company-says-coronavirus-vaccine-ready-by-early-2021-120092401619_1.html

