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INDIA TODAY

Tue, 06 July 2021

IAF wants anti-drone systems with laser weapons to destroy UAVs

The Indian Air Force (IAF) wants anti-drone systems that can be armed with laser weapons and destroy unmanned aerial vehicles (UAVs). The IAF has floated a Request for Information (RFI) for the same

By Abhishek Bhalla, Manjeet Singh Negi

New Delhi: The Indian Air Force (IAF) wants 10 anti- drone systems that can be armed with laser directed energy weapon to bring down rogue drones in wake of the attack on the Jammu Air Force station where unmanned aerial vehicles (UAVs) were used to drop bombs.

A day after the attack on June 27, the IAF floated a Request for Information (RFI) to seek responses from Indian companies for Made in India counter-drone system called Counter Unarmed Aircraft System (CUAS). As per the RFI, the IAF would be deploying these systems at different air bases across the country.

The IAF want anti-drone technology to detect, intercept and shoot down drones. (Image: Reuters/ for Representation)

Soft and hard kill options

"The CUAS is intended to detect, track, identify, designate and neutralize hostile UAS. Laser Directed Energy Weapon (Laser-DEW) is essentially required as a kill option," the RFI says.

The RFI mentions that the systems should be equipped with Global Navigation Satellite Jammer System (GNSS) and Radio Frequency jammers as a soft kill option and Laser based Directed Energy Weapon (Laser-DEW) as a hard kill option to destroy the drones.

"It should provide a multi-sensor, multi-kill solution to enforce effective no fly zones for unmanned aircraft while inflicting minimal collateral damage to the surrounding environment. It should generate a composite air situational picture for the operator and generate alerts based on user defined parameters," the requirements in the RFI say.

System should be vehicle-mounted

All the ten CUAS are required in mobile configuration mounted on indigenous vehicles with cross-country capability and powered by indigenous Electrical Power Supply (EPS) system.

The CUAS should have provision for dismounting of all sub systems including integral power solution from the vehicle and mounting on rooftop or open ground.

The entire system should be road and air transportable. The design should include modularity for quick deployment and withdrawal, the RFI says.

Among the other specifications, the RFI also mentions that the radar should have 360 degree coverage with a range of 5 km for a mini unmanned aircraft system.

Mini drones are extremely difficult to detect as they are low flying, slow moving objects and can miss the radars.

Drone dome-like features

The features are similar to Israel's drone dome system that can detect small targets at a distance of 3.5 km and bring down the drones through a high-powered laser beam.

A 360 degree radar system allows precise detection followed by visual tracking by the inbuilt camera. The manufacturers describe it as an end-to-end solution for interception and destruction of hostile drones.

Through its jammers or the high-powered laser beams, the drones can be brought down.

DRDO developing anti-drone system

The Defence Research and Development Organisation (DRDO) has developed an anti-drone technology to detect, intercept and shoot down drones that is undergoing trials.

"It has both soft kill and hard kill capabilities. We are interacting with all security agencies and trying to improve the system. Industry has already taken transfer of technology. Bharat electronic Limited is the ToT holder. Some more industries are coming forward," said DRDO Chairman G Sateesh Reddy speaking to media.

He said the system has been developed and trials are on.

"More inputs being taken from armed forces, discussions on to modify it further," G Sateesh Reddy added.

https://www.indiatoday.in/india/story/iaf-wants-anti-drone-systems-with-laser-weapons-to-destroy-uavs-1824322-2021-07-06

THE TIMES OF INDIA

Tue, 06 July 2021

Jammu hit spurs IAF to quickly acquire 10 anti-drone systems

New Delhi: The IAF now wants to acquire 10 counter-unmanned aircraft systems (CUAS) in the aftermath of the first-ever drone terror strike in the country at the Jammu air force station on June 27.

Indigenous anti-drone system developed by DRDO.

A day after the Jammu attack, which exposed operational gaps in tackling small commercially-available drones rigged with explosives, the IAF issued a RFI (request for information) to seek responses from Indian companies for the counter-drone systems called CUAS.

The existing IAF air defence systems, with advanced radars and missilesystems, are geared towards thwarting air intrusions by larger unmanned aerial vehicles (UAVs), aircraft and helicopters, as was earlier reported by TOI.

"The CUAS is intended to detect, track, identify, designate and neutralize hostile UAS. Laser-Directed Energy Weapons (Laser-DEWs) are essentially required as a kill option," said the RFI.

With the formal selection and procurement process to kick off in the third quarter of this year, the Indian vendors have to specify the delivery schedule. The IAF is keen to commence delivery of the CUAS at the earliest after the contract is inked and complete it within a year. The vendors also have to specify whether the CUAS is designed, developed and manufactured in India or will be manufactured under transfer of technology from a foreign company.

The CUAS should provide "a multi-sensor, multi-kill solution" to enforce effective no-fly zones for micro and mini drones while inflicting "minimal collateral damage" to the surrounding environment.

The sensors should have active phased array radars with 360-degree coverage and a 5-km range, RF (radio frequency) sensors, electro-optical and infra-red systems.

The "soft kill" options should have global navigation satellite jamming systems (GNSS) to disrupt or spoof the GPS, GLONASS, BeiDou and Galileo used by drones. The "hard kill", in turn, will through the Laser-DEWs.

"All the ten CUAS are required in mobile configuration mounted on indigenous vehicles with cross-country capability and powered by indigenous electrical power supply systems," said the RFI.

Air Chief Marshal R K S Bhadauria had last week said IAF did have a limited number of "soft kill" jammers to disrupt the command-and-control links of small drones and "hard kill" counter-drone systems but they had not been deployed at the Jammu air station because it did not have "critical assets" like fighter jets.

IAF is closely working with DRDO on its anti-drone systems, which have directed energy weapons like lasers and will soon finish their trials. "It's a new kind of threat. Many of the projects have already been undertaken and some of the systems were already fielded," he had said.

DRDO has developed two anti-drone DEW systems, with a 10-kilowatt laser to engage aerial targets at 2-km range and a compact tripod-mounted one with a 2-kilowatt laser for a 1-km range. But they are yet to be productionized in large numbers, as was earlier reported by TOI.

https://timesofindia.indiatimes.com/india/iaf-now-wants-to-acquire-10-counter-drone-systems-after-jammu-attack/articleshow/84146253.cms

Tue, 06 July 2021

जम्मू ड्रोन हमले के बाद भारतीय कंपनियों से 10 एंटी-ड्रोन सिस्टम खरीदेगी वायुसेना, आमंत्रित की बोलियां

***CUAS* का उद्देश्य यूएएस का पता लगाना, ट्रैक करना, पहचानना, नामित करना और बेअसर करना है। लेजर-डायरेक्टेड एनर्जी वैपन (*Laser-DEWs)* अनिवार्य रूप से एक किल ऑप्शन' के रूप में आवश्यक हैं।**

जम्मू वायु सेना स्टेशन पर **27** जून को देश के पहले ड्रोन आतंकी हमले के बाद भारतीय वायुसेना अब दस मानव रहित विमान प्रणाली (**CUAS**) प्राप्त करना चाहती है। भारतीय वायु सेना (**IAF**) ने **CUAS** नाम की काउंटर-ड्रोन सिस्टम के लिए भारतीय कंपनियों से प्रतिक्रिया मांगने के संबंध में सूचना के लिए एक अनुरोध (**RFI**) जारी किया है, जिसने विस्फोटकों से भरे छोटे व्यावसायिक रूप से सुलभ ड्रोन से निपटने में परिचालन संबंधी कमियों का खुलासा किया।

पिछले महीने जम्मू एयरफोर्स स्टेशन पर हुए ड्रोन हमले में 2 ड्रोन का इस्तेमाल हुआ था. (सांकेतिक फोटो)

CUAS का उद्देश्य यूएएस का पता लगाना, ट्रैक करना, पहचानना, नामित करना और बेअसर करना है। लेजर-डायरेक्टेड एनर्जी वैपन (**Laser-DEWs**) अनिवार्य रूप से एक 'किल ऑप्शन' के रूप में आवश्यक हैं। भारतीय विक्रेताओं को डिलीवरी शेड्यूल बताना होगा क्योंकि औपचारिक चयन और खरीद प्रक्रिया इस साल की तीसरी तिमाही में शुरू होगी। **IAF**, डील साइन

होने के साथ ही **CUAS** की डिलीवरी शुरू करना चाहता है और इसे एक साल के भीतर पूरा करना चाहता है।

विक्रेताओं को यह भी बताना होगा कि क्या सीयूएएस भारत में डिजाइन, प्रोड्यूस और निर्मित किए जाएंगे या इसे किसी विदेशी कंपनी के साथ प्रौद्योगिकी हस्तांतरण समझौते के माध्यम से बनाया जाएगा। सीयूएएस को सूक्ष्म और मिनी ड्रोन के लिए नो-फ्लाई जोन को प्रभावी ढंग से लागू करने के लिए "मल्टी-सेंसर, मल्टी-किल सॉल्यूशन" प्रदान करना चाहिए। **360** डिग्री कवरेज और **5** किलोमीटर रेंज के साथ सक्रिय चरणबद्ध सरणी रडार, आरएफ (रेडियो फ्रीक्वेंसी) सेंसर, इलेक्ट्रो-ऑप्टिकल और इन्फ्रारेड सिस्टम सभी को सेंसर में शामिल किया जाना चाहिए।

एंटी-ड्रोन सिस्टम पर DRDO के साथ मिलकर काम कर रहा IAF

ग्लोबल नेविगेशन सैटेलाइट जैमिंग सिस्टम (**GNSS)** का उपयोग "सॉफ्ट किल" सेटिंग्स में ड्रोन द्वारा उपयोग किए जाने वाले **GPS, GLONASS, BeiDou** और **Galileo** को बाधित या खराब करने के लिए किया जाना चाहिए। लेजर-डीईडब्ल्यू का उपयोग "हार्ड किल" को पूरा करने के लिए किया जाएगा। आरएफआई ने कहा, "सभी दस सीयूएएस स्वदेशी वाहनों पर क्रॉस-कंट्री क्षमता वाले और स्वदेशी विद्युत बिजली आपूर्ति प्रणालियों द्वारा संचालित मोबाइल कॉन्फिगरेशन में आवश्यक हैं।"

पिछले हफ्ते एयर चीफ मार्शल आरकेएस भदौरिया ने कहा था कि भारतीय वायुसेना के पास छोटे ड्रोन के कमांड-एंड-कंट्रोल लिंक को बाधित करने के लिए सीमित संख्या में "सॉफ्ट किल" जैमर और "हार्ड किल" काउंटर-ड्रोन सिस्टम थे, लेकिन उन्हें जम्मू हवाई स्टेशन पर तैनात नहीं किया गया था क्योंकि इसमें लड़ाकू जेट जैसी "महत्वपूर्ण संपत्ति" की कमी थी।

IAF अपने एंटी-ड्रोन सिस्टम पर **DRDO** के साथ मिलकर काम कर रहा है, जिसमें लेजर जैसे निर्देशित ऊर्जा हथियार शामिल हैं और उनका परीक्षण पूरा होने वाला है। "यह एक नए तरह का खतरा है। कई परियोजनाएं पहले ही शुरू की जा चुकी हैं और कुछ प्रणालियां पहले ही लागू की जा चुकी हैं।" एक रिपोर्ट में कहा गया है कि **DRDO** ने दो एंटी-ड्रोन **DEW** सिस्टम विकसित किए हैं, एक **2**-किमी रेंज एंगेजमेंट के लिए **10**-किलोवाट लेजर के साथ और दूसरा **2**-किलोवाट लेजर के साथ **1**-किमी रेंज एंगेजमेंट के लिए। लेकिन उन्हें अभी तक बड़े पैमाने पर उत्पादन नहीं किया गया है।

https://www.tv9hindi.com/india/after-the-jammu-drone-attack-iaf-will-buy-10-anti-drone-systems-from-indian-companies-invites-bids-723747.html

हिन्दुस्तान

Tue, 06 July 2021

ट्रायल: भीड़ को रोकेगा वाहन, उपद्रवियों पर भी रहेगी नजर

मेरठ: मेरठ रैपो में भीड़ काबू करने के लिए डीआरडीओ के बनाए गए वाहनों का ट्रायल होगा। प्रशिक्षण के लिए आए **146** जवानों को ट्रेनिंग के दौरान इन वाहनों की जानकारी दी जाएगी। वज्र वाहन से यह वाहन एडवांस बनाया गया है और कई तरह की सुविधाएं भी इसमें बढ़ाई गई हैं। इसमें खतरे के समय पर एक शील्ड का निर्माण हो जाता है, ताकि हमले से बचा जा सके।

रैपो के प्रशिक्षण कार्यक्रम में सोमवार को उपकमांडेंट हरिशचंद नेगी, उपकमांडेंट नीरज कुमार झा, सहायक कमांडेंट प्रमोद कुमार, सहायक कमांडेंट गोविंद सिंह नेगी, सहायक कमांडेंट अजीत कुमार मौजूद रहे।

हमला होते ही बन जाती है शील्ड

इसकी खासियत है कि **500** किलो तक का वजन इस वाहन से बस एक बटन दबाकर अलग किया जा सकता है। साथ ही इसमें एडवांस कैमरों का इस्तेमाल किया है, जो आसपास के इलाके पर हर दिशा में नजर रख सकता है। इस वाहन की खास बात यह है कि खतरा होने पर या किसी तरह का हमला होने पर इसके ऊपर एक शील्ड बन जाती है। ऐसे में अंदर मौजूद जवानों को खतरा नहीं होता।

सीएए बवाल और दो अप्रैल हिंसा की केस स्टडी पढ़ेंगे

रैपो में ट्रेनिंग के दौरान जवानों को फ्रांस और दक्षिण अफ्रीका में हुई हिंसा के साथ ही मेरठ में हुए सीएए बवाल, दो अप्रैल हिंसा, अलीगढ़, जयपुर, दिल्ली हिंसा की केस स्टडी पढ़ाई जाएगी। आधुनिक हथियार और विशेष तकनीक की जानकारी दी जाएगी। मार्शल आर्ट्स, फायर फाइटिंग, लेस-लीथल वेपन आदि के बारे में जवान जानकारी हासिल करेंगे।

डीआरडीओ की ओर से दो नए वाहनों को ट्रायल के लिए दिया गया है। यह वाहन अभी आरएएफ में लांच नहीं हुए हैं। करीब छह माह बाद इनका प्रपोजल भेजा जाएगा। अभी इसका ट्रायल चल रहा है।

अखिलेश कुमार सिंह, डीआईजी रैपो।

https://www.livehindustan.com/uttar-pradesh/meerut/story-trial-vehicle-will-stop-the-crowd-miscreants-will-also-be-monitored-4192774.html

Business Standard

Tue, 06 July 2021

What is a short-range ballistic missile?

A short-range ballistic missile or SRBM is a type of ballistic missile, which has a range of 1,000 km or less. SRBMs are relatively low-cost and provide ease of configuration, which makes them strategically important. They are useful in regional conflicts. SRBMs form a part of the wide group of theatre ballistic missiles, which includes ballistic missiles with a range of less than 3,500 km.

Short-range Ballistic Missile

What is a ballistic missile?

A ballistic missile follows a ballistic trajectory, hence the name. Ballistic trajectory or projectile motion is motion experienced by a particle or an object that is projected near the surface of Earth and moves along a curved path under the influence of gravity.

The missile follows the trajectory to deliver warheads on a predetermined target. These missiles are, for the most part of their journey, unpowered and are guided only during relatively brief periods. SRBMs follow a path, which stays within Earth's atmosphere, while intercontinental ballistic missiles (ICBMs) are launched on a sub-orbital trajectory. ICBMs have a minimum range of 5,500 km and are primarily designed for delivery of nuclear warheads. These weapons are in a different category compared to cruise missiles which are aerodynamically guided in a powered flight.

The first modern ballistic missile was developed by Nazi Germany in the 1930s and 1940s. Nazis carried out the first successful launch of V-2 ballistic missile on October 3, 1942. It was first used in operation against Paris in September 1944. The first intercontinental ballistic missile is R-7 Semyorka developed by the Soviets during the Cold War.

Indian SRBMs

Over the years, India's missile programme has developed various missiles successfully. At present, India has a total of 8 SRBMs, some of which are under development.

Agni-I: This missile has a range of 700-900 km

K-15: This has a range of 750 km

Prithvi I: It has a range of 150 km

Prithvi II: Has a range of 250-350 km

Prithvi III: Gives a range of 350-750 km

Prahaar: Has a range of 150 km and is expected to replace Prithvi I

Shaurya: Gives a range of 700 km

Pralay: Has a range of 350-500 km

https://www.business-standard.com/about/what-is-short-range-ballistic-missile#collapse

COVID 19: DRDO's Contribution

THE TIMES OF INDIA

Tue, 06 July 2021

Four Covid patients treated with 2-DG

Nashik: Four Covid patients in Nashik became the first in the city to be treated with the 2-deoxy-D-glucose (2-DG) oral drug in June. The treatment has shown good results. Dr Manoj Chopda, director of the Magnum hospital, said the drug has to be administered to the patients in the first seven days of symptoms and to those requiring oxygen support.

"The number of severe Covid cases dropped in June. So, there were very few patients who required the medicine. We have administered the drug to four middle-aged persons," said Dr Chopda.

The 2-DG drug developed by the Defence Research and Development Organisation was provided authorisation for emergency use by the Drugs Controller General of India on June 1 as an adjunct therapy for moderate to severe coronavirus patients. The drug has the potential to reduce a patient's average recovery time by two and a half days and oxygen demand by up to 40%.

Dr Chopda said that the drug is in powdered form and has to be dissolved in water. It is administered orally to the patients. The four patients were given the drug as per their requirement for three to five days and their demand for oxygen drastically reduced. "This also helped in speedy recovery and lesser hospitalization of the patients," he added.

The Nashik civil hospital has not used the drug so far and neither have they decided to buy the drug at this point of time, civil surgeon Dr Ashok Thorat said.

The availability of the drug is also a problem. Dr Chopda got it from Hyderabad. "Since it was not available here, we got the same from Hyderabad. Considering the chances of third wave of Covid, we hope that the drug is made available at the stores soon," said Dr Chopda.

Rajendra Dhamne, the president of Nashik City Chemists and Druggists Association, said, "The stockists are yet to get the drug and they are in the process of getting the minimal stock. Since this is a specific drug, they would be bring huge quantities with sometime later. Currently, as the Covid cases are very low, the requirement is also on the lower side."

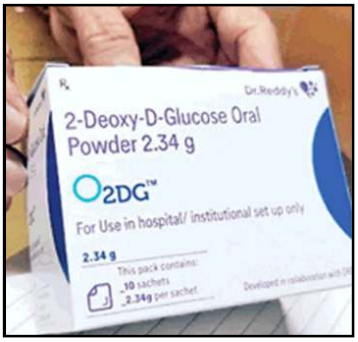
https://timesofindia.indiatimes.com/city/nashik/four-covid-patients-treated-with-2-dg/articleshow/84150386.cms

नईदुनिया

Tue, 06 July 2021

इंदौर में भी मिलने लगा डीआरडीओ का 2-डीजी सैशे

इंदौर: रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) में विकसित 2-डी आक्सी-डी-ग्लूकोज (2-डीजी) सैशे कोविड मरीजों के इलाज में काफी कारगर माना गया। इंदौर में अब तक एमवायएच सहित इक्का-दुक्का अस्पतालों में ही डीआरडीओं द्वारा सीधे तौर पर दिए गए 2-डीजी सैशे का उपयोग हुआ है। अब यह सैशे इंदौर के दवा बाजार में मरीजों के लिए आसानी से उपलब्ध है। मई के अंत में शहर के एक निजी अस्पताल में 70 वर्षीय बुर्जुग महिला को यह सैशे डीआरडीओ से विशेष अनुमति लेकर उपलब्ध करवाए गए थे। उसके बाद कोविड संक्रमित कई मरीजों के लिए स्वजनों ने इस सैशे की खोज शुरू की थी। अब जाकर इंदौर में चुनिंदा दुकानों पर यह सैशे मिलने लगा है।



डीआरडीओ 2 डीजी सैशे कोरोना मरीजों में बढ़ा रहा आक्सीजन का लेवल।

बाजार में एक सैशे की कीमत 900 रुपये है। किसी भी कोविड मरीजों को चार से पांच सैशे बीमारी के आधार पर दिए जाते हैं। क्वालिटी ड्रग हाउस के संचालक डा. मकरंद शर्मा के मुताबिक चिकित्सकों व मरीज के स्वजनों की मांग पर दवा कंपनी के माध्यम से हमने 2-डीजी सैशे के 100 पैकेट बुलवाए हैं। अभी तक 10- 15 मरीजों के लिए यह दिया जा चुका है।

काफी मशक्कत के बाद मिला : नरवल (उज्जैन) निवासी 44 वर्षीय जाकिर पटेल की कोविड संक्रमण के बाद स्थिति इतनी खराब हुई कि उन्हें अस्पताल में वेंटीलेटर पर रखना पड़ा। उनके रिश्तेदार अमजद पटेल के मुताबिक जाकिर का आक्सीजन सेचुरेशन 60 से 70 फीसद तक आ रहा था। चिकित्सकों की सलाह पर 2-डीजी के पांच सैशे सुबह-शाम दिए गए। इससे आक्सीजन लेवल 90 से 95 फीसद तक आ गया।

एक महीने पहले शहर के एक निजी अस्पताल में भर्ती बुर्जुग महिला को यह सैशे दिया गया था, तभी से हम इसे देश के अन्य शहरों में भी खोज रहे थे। अब यह बाजार में उपलब्ध हुआ है। जबरन कालोनी निवासी 38 वर्षीय रानी मिश्रा को कोविड संक्रमण हुए करीब डेढ़ माह बीत गया। सांस लेने में परेशानी के कारण वो अस्पताल में भर्ती है। उनके पति अनिल मिश्रा के मुताबिक चिकित्सकों की सलाह पर अभी तक उन्हें 2-डीजी के पांच सैशे दिए जा चुके है। अब स्वास्थ्य में सुधार दिख रहा है।

https://www.naidunia.com/madhya-pradesh/indore-drdo-2dg-sachet-in-indore-drdo-2dg-sachet-now-available-in-indore-6962530

THE TIMES OF INDIA

Tue, 06 July 2021

Jalgaon GMCH starts preparing for third wave

By Ranjan Dasgupta

Nashik: Given the predictions of the third wave of Covid in the future, which is likely to affect children more, Jalgaon Government Medical College & Hospital (GMCH) has started preparations to deal with any surge in Covid cases among minors.

Jalgaon GMCH has handled bulk of the Covid patients in Jalgaon efficiently, along with patients coming from neighbouring districts and states, during the two waves.

Jaiprakash Ramanand, the dean of Jalgaon GMCH, told TOI that the GMCH has started putting in place a series of measures to treat children, including including the new born, in case they contract Covid in the third wave.

"We have completed a three-day extensive training of all our 250 nursing staff in treating children suffering from Covid. Unlike adult Covid patients, children need to be handled very carefully. They have been trained how to administer injections, check temperature etc," he said.

The hospital authorities are now in the process of shortlisting 50 nurses of the 250, who would further be trained in handling paediatric patients admitted in ICU.

"We have also purchased 10 paediatric ventilators, which will be used if needed. We also have 18 warmers that can be used in case the need arises," said the dean.

According to him, the GMCH has 15 beds at its paediatric ward, which will be initially used to treat children suffering from Covid. "In case paediatric cases rise, we shall make use of our burn ward, which has 18 beds and the postnatal ward comprising 39 beds. We can further ramp up our paediatric ward in case there is a need," he said.

The Jalgaon GMCH, which has a medical oxygen tank with a capacity of 20 MT, is in the process of setting up two more oxygen generation plants using the Pressure Swing Adsorption (PSA) technology. Both the plants will produce oxygen over 23 litres/minute. "One PSA plant is being provided by the Defence Research & Development Organisation (DRDO) and the other one is being funded by the district planning and development council (DPDC), he said.

https://timesofindia.indiatimes.com/city/nashik/jalgaon-gmch-starts-preparing-for-third-wave/articleshow/84150428.cms

Defence News

Defence Strategic: National/International

REPUBLICWORLD.COM

Tue, 06 July 2021

Indian Army COAS MM Naravane to discuss anti-drone technology with UK Counterpart

During his visit to the United Kingdom and Italy, chief of Army Staff General MM Naravane will be meeting his UK counterpart to discuss anti-drone technology

By Shivani Sharma

General MM Naravane, the Chief of Army Staff (COAS) is on an official 4-day visit to the United Kingdom and Italy from July 5-July 8, 2021. During the visit, he will be meeting his counterparts and senior military leaders of the two countries with an aim of enhancing India's defence cooperation.

General MM Naravane to meet his counterpart in UK

MM Naravane's visit to the United Kingdom is scheduled for two days (05 and 06 July 2021) during which the COAS will interact with the Secretary of State for Defence, Chief of Defence Staff, Chief of General Staff and other dignitaries. He will also be visiting various army formations where he will exchange ideas on issues of mutual interest.

The UK and Indian governments are currently in discussions about partnerships and sharing of expertise in four key capability areas: Cyber, Army modernisation, Maritime Technology, and Future Combat Air Systems.

The Chief of Army Staff will be discussing the new challenge of drone attacks and how agencies and industry can work for Future Combat Air Systems, official sources said. The UK has a major role to play in the development of India's indigenous combat air capability. Under the Defence and International Security Partnership (DISP), the UK and India have formed six bilateral working groups as subgroups to the Defence Consultative Group. India and UK have been working together to develop relationships between the Army, Navy, Air Force, Science & Technology, Equipment, and the Joint Environment.

The UK has a unique, world-leading technological and industrial-military offer as the second-largest defence exporter in the world, the UK understands drive-in India towards self-reliance in the defence sector. The Chief of Army Staff will be interacting with military leadership in the UK to look for the aspects of the co-creation of technology; to not only 'Make in India' but also 'Create in India' through the co-development of Intellectual Property for the Army. Looking to the threats of drone and UAV attacks, Indian Army establishments are aggressively onto a mission of deploying anti-drone systems.

The UK has a one-of-a-kind Counter Drone system that works by detecting and tracking drones in surrounding airspace and alerting airports of unauthorised drone use quickly and efficiently. This system also works to locate the drone pilots themselves and can be used to identify their location.

This technology has been specifically designed for Heathrow Airport by Operational Solutions Ltd and comprises a variety of leading counter-drone technologies. According to the official sources, the Indian Army Chief will be reviewing the possibilities of these British Counter Drone technologies for India.

During the second leg of his tour (07 and 08 July 2021), the Army Chief will be holding important discussions with the Chief of Defence Staff and Chief of Staff of the Italian Army. Additionally, the COAS will also inaugurate the Indian Army Memorial in the famous town of Cassino and will be briefed at the Italian Army's Counter IED Centre of Excellence at Cecchingola, Rome.

https://www.republicworld.com/india-news/general-news/indian-army-coas-mm-naravane-to-discuss-anti-drone-technology-with-uk-counterpart.html

ThePrint

Tue, 06 July 2021

What are military theatre commands and why does India want to switch to them

A proposal is being discussed to have 5 unified or theatre commands that will help in better planning & military response, and aim to have unified approach to fighting any future war

By Snehesh Alex Philip

New Delhi: India is in the process of carrying out the biggest military reforms it has ever seen — theaterisation.

From left to right: Chief of Defence Staff Bipin Rawat, Army chief Manoj Mukund Naravane, Navy chief Karambir Singh and Air Marshal RKS Bhadauria | Photo: Praveen Jain | ThePrint

The plan is to have five unified or theatre commands, which will help in better planning and military response, and aim to have a unified approach to fighting any future war.

However, the process, which is being led by Chief of Defence Staff Gen Bipin Rawat, has expectantly not been a smooth one — as military theorist and historian, Sir B.H. Liddell Hart, famously said: "The only thing harder than getting a new idea into the military mind is to get the old one out."

Internal differences over the structure and scope of the theatre command came out in public last week with Gen Rawat terming the Indian Air Force as a "supporting arm" like the Artillery and the Engineers and the Air Chief Air Chief Marshal R.K.S. Bhadauria pointing out that there is much more to air power.

While there had been murmurs in the official corridors of power that all was not well, serious differences over the basic structure came out last month during a meeting to approve a draft note for the Prime Minister Narendra Modi-led Cabinet Committee on Security, for approval to create theatre commands.

While the creation of theatre or unified commands was the decision of the government, CDS was mandated to bring it to fruition.

With various questions relating to structure, command and finer aspects remaining unanswered, a committee has now been set up on the orders of Defence Minister Rajnath Singh so all issues are completely thrashed out.

Here is everything you want to know about theaterisation and what India hopes to achieve from it.

Theaterisation has its origins in World War I

The dictionary meaning of a theatre of war is "the entire land, sea and air areas that is or may become involved directly in war operations".

The word 'theatre warfare' became more prominent during World War II with the battles being fought across continents.

During World War 1 too, battles were fought across the world, but the major ones took place in what was then known as the European theatre.

In World War II, new theatres emerged with multiple fronts — Nordic Front, Western Front and Eastern Front. There was also the Pacific-Asian Theater, Africa and Middle East Theater.

These theatres referred to the geographical grounds of the battle and all deployments — army, navy and air force — happened accordingly in a unified manner.

Depending on what kind of operations was being undertaken, officers from specific services took over the command even though it was largely led by the Army.

As of now, almost all major countries like China, Russia, the US, the UK and France work on a theatre command concept. However, most of this theatre is based on its global outlook and part of their expeditionary character.

China is the latest entrant to a theatre concept and comes at a time when it has ambitions to play a larger role in the world.

Why India seeks theatre commands

India currently has 19 military commands with 17 of them service-oriented. While both the Army and the Air Force have seven commands each, the Navy has three.

India also has a Tri-Service Command — Andaman and Nicobar Command — besides the Strategic Forces Command (SFC), which looks after the country's nuclear stockpile.

The aim is to bring all the 17 individual commands into four or five unified or theatre commands. It might also have two more functional commands for training and logistics.

The rationale being this will help in better planning and military response and also bring down cost.

While the cost may go up in the immediate future since all theatres would have to be armed with sufficient systems, it will prove to be cost-effective in the long term as all acquisition will be a unified one.

The classic example for the perils of not having a unified approach to acquisition is the procurement of the Apache attack helicopters from the US. While the Indian Air Force got 22 Apaches, the Army has also placed orders for six of these choppers. The end result — loss of at least Rs 2,500 crore and haphazard operational planning.

The other aim is to have a unified approach to fighting the future wars. Sources said China's theaterisation move has had an effect too.

"One thing that we can say about China is the uniformity in response, be it in the East or the Ladakh in the north. This is so because China's Western Theater Command looks after the entire borders with India unlike us where we have multiple Commands and structures to respond with different officers at the helm," the senior officer told ThePrint.

The need for a unified approach to war fighting was brought out in the deliberations after the 1999 Kargil battle.

The Kargil Review Committee and the then Group of Ministers besides the Naresh Chandra Committee had called for structural changes in higher defence management.

It was the Shekatkar committee, headed by Lt Gen. (retd) D.B. Shekatkar, which had recommended the creation of the post of CDS and theatre commands.

Until this committee, every other panel had only spoken about the need for unified planning.

While the Army and the Navy are on board on the issue of theatersisation, the IAF while supporting the move says there can't be multiple theatres. They argue that a single theatre is what is needed.

Theatre proposals

According to the current proposal that was discussed during last month's meeting, there will be five theatres — Northern Land Theatre (Jammu and Kashmir, Ladakh and Central sector) Western Land Theatre (Pakistan centric), Eastern Land Theatre, Maritime Theatre Command, and Air Defence Command.

However, Gen Rawat Friday said the Northern Command will not see any change and will remain in its present form for the time being since it is operationally sensitive as it has China and Pakistan besides internal security to look after.

The first two that would be rolled out are Maritime Theatre Command (MTC) and Air Defence Command (ADC).

As reported earlier, the MTC will see a merger of the eastern and western naval commands, besides getting elements from the Army and the Air Force.

The MTC will be headed by a three-star Naval officer and will also have one two-star officer from the IAF and a three-star officer from the Army.

Similarly, the ADC will be headed by a three-star IAF officer, along with a three-star Army officer and a two-star Naval officer.

The other theatres planned will be headed by three-star Army officers with elements from the IAF and the Navy.

https://theprint.in/defence/what-are-military-theatre-commands-and-why-does-india-want-to-switch-to-them/690487/

नवभारत टाइम्स

Tue, 06 July 2021

भारतीय नौसेना ने चीन की नाक के नीचे जापान, दक्षिण कोरिया के साथ किया जंग का अभ्यास

Indian Navy Warship In East China Sea: ***चीन के साथ लद्दाख में चल रहे तनाव के बीच जापान और दक्षिण कोरिया की नौसेना के साथ भारतीय नौसेना ने अभ्यास किया है। इसके तहत दोनों देशों की सेनाओं ने जंग की तैयारी को परखा।***

By Shailesh Shukla

हाइलाइट्स:

- ***भारत ने समुद्र में चीनी ड्रैगन की चुनौती मुंहतोड़ जवाब देने की तैयारी शुरू कर दी है***
- ***भारतीय नौसेना के जहाज आईएनएस किलटान ने पूर्वी चीन सागर में अभ्यास किया है***
- ***भारतीय युद्धपोत ने जापान और दक्षिण कोरिया की सेना के साथ तैयारियों को परखा***

तोक्योसोल/: लद्दाख में चल रहे तनाव के बीच भारत ने समुद्र में चीनी ड्रैगन की चुनौती मुंहतोड़ जवाब देने की तैयारी शुरू कर दी है। भारतीय नौसेना के अत्याधुनिक जंगी जहाज आईएनएस किलटान ने पूर्वी चीन सागर में जापान और दक्षिण कोरिया की सेना के साथ मिलकर जंग लड़ने का अभ्यास किया है। यह वही क्षेत्र है जहां पर चीन का अपने पड़ोसी देश जापान और ताइवान के साथ तनाव काफी बढ़ गया है।

ऐंटी सबमरीन खूबियों से लैस स्वदेशी युद्धपोत आईएनएस किलटान को भारतीय नौसेना ने सुदूर पूर्व के दौरे पर तैनात किया है। इसी तैनाती के दौरान भारतीय जंगी जहाज ने जापान के जेएस हमाना युद्धपोत के साथ पूर्वी चीन सागर में द्विपक्षीय अभ्यास किया। इस दौरान दोनों ही देशों की नौसेनाओं ने एकस किया।दूसरे के साथ मिलकर जंग लड़ने का अभ्या-

भारतीय नौसैनिक जहाज ने किया जंगी अभ्यास

दक्षिण कोरियाई जंगी जहाज के साथ युद्ध की तैयारी

इसके बाद भारतीय नौसैनिक युद्धपोत ने दक्षिण कोरियाई जंगी जहाज के साथ युद्ध की तैयारियों को परखा। दक्षिण कोरिया की ओर से ग्येओंगनम नामक के फ्रीगेट ने हिस्सा लिया। भारतीय नौसेना ने एक बयान जारी करके बताया कि यह अभ्यास **28** जून को हुआ। खबरों के मुताबिक अब भारतीय युद्धपोत चीन के एक अन्य विरोधी देश फिलीपीन्स के पास पहुंच गया है।

वहीं इंडियन नेवी के एक अन्य युद्धपोत आईएनएस ऐरावत पिछले दिनों वियतनाम के कैमरान्ह बे इलाके का दौरा किया था। नौसेना ने बताया कि इस युद्धपोत को कैमरान्ह बे इलाके में तैनात किया गया है। भारतीय युद्धपोत ऐसे समय पर साउथ चाइना सी पहुंचा है जब चीन का अपने पड़ोसी देशों के साथ विवाद काफी बढ़ गया है। साथ ही चीनी जहाजों की घुसपैठ लगातार हिंद महासागर में बढ़ती जा रही है।

आईएनएस किलटान का 81 फीसदी हिस्सा स्वदेशी

भारत ने चीन को दिखा दिया है कि अगर वह उसके प्रभाव के क्षेत्र हिंद महासागर में घुसपैठ कर सकता है तो भारतीय जंगी जहाज भी साउथ चाइना सी की गहराईयों को नापने के लिए कभी भी पहुंच सकते हैं। इससे पहले भारत ने गलवान घाटी हिंसा के बाद अपने एक युद्धपोत को दक्षिण चीन सागर में तैनात कर दिया था। इस युद्धपोत को उस इलाके में तैनात किया गया है, जहां चीन की पीपल्स लिबरेशन आर्मी की नौसेना ने किसी भी अन्य फोर्स की मौजूदगी पर ऐतराज जताया था।

इस जहाज का **81** फीसदी हिस्सा स्वदेशी है और परमाणु, जैविक और रासायनिक हमलों से मुकाबले के लिए अच्छी तरह से सुसज्जित है। इसमें देश में ही बने कई हथियारों और सेंसरों को जोड़ा गया है। यह हैवीवेट टारपीडो, **ASW** रॉकेट, **76** मिमी कैलिबर मीडियम रेंज गन और **2** मल्टीबैरल **30** एमबंदूकों .एम . से लैस है। यह पहला प्रमुख जहाज है, जिसकी डिलिवरी से पहले सभी प्रमुख हथियारों और सेंसरों के समुद्री परीक्षण किए गए हैं।

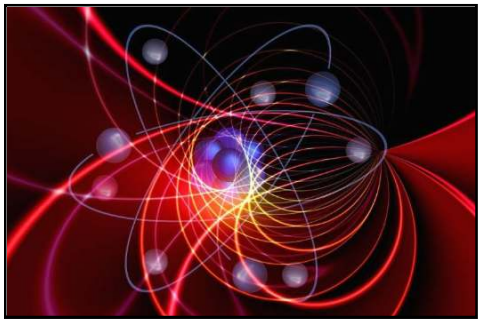
https://navbharattimes.indiatimes.com/world/asian-countries/indian-navy-warship-conducts-military-exercise-with-japan-south-korean-vessel-in-east-china-sea/articleshow/84138388.cms

PHYS.ORG

Tue, 06 July 2021

Software evaluates qubits, characterizes noise in quantum annealers

High-performance computer users in the market for a quantum annealing machine or looking for ways to get the most out of one they already have will benefit from a new, open-source software tool for evaluating these emerging platforms at the individual qubit level.



Credit: CC0 Public Domain

"We were motivated by the need for validation and verification of quantum annealers, similar to what is currently done by organizations when they purchase a new classical supercomputer," said Carleton Coffrin, a computer scientist and expert in artificial intelligence at Los Alamos. "They conduct acceptance testing on a huge set of benchmarks. We didn't have good analogs for that on the quantum annealing computers. For quantum annealing, our new a Quantum Annealing Single-qubit Assessment, or QASA, protocol gives us one tool for acceptance testing."

Coffrin is principal investigator of the project "Accelerating Combinatorial Optimization with Noisy Analog Hardware," which developed the paper, "Single-Qubit Fidelity Assessment of Quantum Annealing Hardware."

QASA is available as open-source software at github.com/lanl-ansi/QASA . QASA, which is executed in parallel for all qubits on a quantum annealing device, provides a detailed characterization through salient metrics about individual qubits, such as their effective temperature, noise, and bias. In the key breakthrough of this work, the single-qubit model can be executed in parallel for every qubit in a quantum annealing hardware device.

"The QASA protocol could eventually find a wide range of uses, such as tracking improved performance in quantum annealing computers and helping hardware developers spot inconsistencies in their own devices," Coffrin said. With the protocol, users of quantum annealers could also calibrate their algorithms to their specific computers.

"Characterizing the noise in the system is probably the most impactful thing because it's the least well-recognized aspect of the hardware," Coffrin noted. "We can measure it, and understand how it's distributed throughout the whole hardware."

The protocol sheds light on the variability of qubit properties across the entire computer. With this detailed analysis of the properties of each qubit, quantum annealer users can employ QASA to quickly verify the level of consistency across the hardware's qubits and either avoid or compensate for non-ideal qubits. Users also use this information to calibrate idealized quantum simulations running on specific hardware devices.

The analysis also yields several key metrics, such as qubit noise, that support tracking technical improvements on quantum annealing hardware as it is developed.

As both gate-based quantum computers and quantum annealing computers move from science projects to real-world tasks, measuring and tracking changes in the fidelity of quantum hardware platforms is essential to understanding the limitations of these devices and quantifying progress as these platforms continue to improve, the paper states.

In a data-driven discovery process, Coffrin said, the Los Alamos team used machine learning and data from a D-Wave 2000Q computer at the Laboratory to develop the QASA protocol, which can run on any quantum annealer.

"We ran a bunch of experiments on our D-Wave, putting in different values for one parameter, and watched what happened," he said. The results yielded a surprising curve when graphed. "We had to develop a new theoretical model to correspond to what's going on." Then the team designed a machine-learning method that fit the theoretical model to the data.Quantum annealing computers operate on a different principle than gate-based quantum computers, which use gates analogous to the logic gates on a classical binary computer.

Quantum annealers leverage a smooth quantum evolution to exploit fundamental quantum principles in finding high quality solutions. This process is more specialized than gate-based computer but is still sufficient to solve challenging computational problems in fields such as magnetic materials, machine learning and optimization, all of which rely on optimization, or finding the best answer among all plausible answers. For example, finding the shortest route for a delivery truck dropping packages at multiple locations is a classic optimization problem.

More information: Jon Nelson et al, Single-Qubit Fidelity Assessment of Quantum Annealing Hardware, *IEEE Transactions on Quantum Engineering* (2021). DOI: 10.1109/TQE.2021.3092710

https://phys.org/news/2021-07-software-qubits-characterizes-noise-quantum.html

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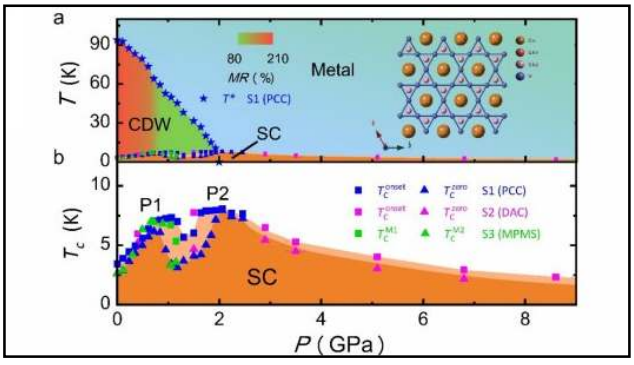
Tue, 06 July 2021

Researchers discover unusual competition between charge density wave and superconductivity

By Zhang Nannan

A research team led by Prof. Chen Xianhui from University of Science and Technology of China of the Chinese Academy of Sciences (CAS) found an unusual competition between charge density wave (CDW) and superconductivity in CsV_3Sb_5, a layered kagome metal, which provides key experimental evidence for understanding novel CDW and superconductivity. The result was published in *Nature Communications* and recommended as featured article.



Pressure temperature phase of CsV3Sb5. Credit: Yu et al.

Traditional superconductivity and CDW are two different electronic states, which both originate from electron phonon coupling and Fermi instability. In the conventional coexistence image of CDW and superconductor, after entering the CDW state, the energy gap is opened due to the nesting of Fermi surface, resulting in the loss of density of states, showing the behavior of CDW competing with superconductors.

CDW status can be suppressed by increasing pressure or chemical doping. With the suppression of CDW state, the superconducting critical transition temperature (T_c) will show a single dome like behavior. Due to the strong geometric frustration, more novel quantum states, including unconventional superconducting states and chiral density waves, are predicted.

Recently, a novel layered cage structure superconductor CsV_3Sb_5 has been discovered, which has a CDW transition temperature of 94 K. Combined with a variety of pressure means, the

researchers carried out pressure control research on it, and determined the phase diagram of the material under high pressure.

Through measurement of high voltage electric transport and magnetic susceptibility, they found that T_c behaves as a double dome with the increase of pressure, rather than a traditional single dome. When the pressure is between 0.7 GPa and 2 GPa, the samples show abnormal T_c suppression and superconducting broadening. When the pressure reaches 2 GPa, the CDW is completely compressed, and the T_c can reach up to 8 K (three times of that at normal pressure), which is also the highest T_c reported for materials with cage structure.

The anomalous double dome superconducting phase diagram may be caused by the transition from commensurate CDW state to nearly commensurate CDW state. Therefore, the results show that the superconducting state and CDW state of CsV_3Sb_5 are very sensitive to pressure, showing abundant pressure phase diagrams.

This study also reveals the unusual competition between superconductivity and CDW in CsV_3Sb_5, which provides experimental clues for studying the unconventional CDW mechanism.

More information: F. H. Yu et al, Unusual competition of superconductivity and charge-density-wave state in a compressed topological kagome metal, *Nature Communications* (2021). DOI: 10.1038/s41467-021-23928-w

Journal information: Nature Communications

https://phys.org/news/2021-07-unusual-competition-density-superconductivity.html

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Tue, 06 July 2021

Graphene for the protection of paintings: paving the way for novel methods in art preservation and restoration

The exposure of colors used in artworks to ultraviolet (UV) and visible light in the presence of oxidizing agents triggers color degradation, fading and yellowing. These degradation mechanisms can lead to irreversible alteration of artworks. Protective varnishes and coatings currently used to protect art paintings are not acceptable solutions, since their removal requires the use of solvents, which can affect adversely the underlying work surface.

A team of researchers from the Institute of Chemical Engineering Sciences of the Foundation for Research and Technology-Hellas (FORTH/ ICE-HT), the Department of Chemical Engineering of the University of Patras, and the Center for Colloid and Surface Science (CSGI) of the University of Florence, led by Professor Costas Galiotis, had the innovative idea to use graphene veils for the protection of paintings against environmental degradation.

Isolated in 2004 by Geim and Novoselov from the University of Manchester (Nobel Prize in Physics in 2010), graphene has exceptional properties that have already been used in many applications and products. The graphene veil used in this work is a flexible, transparent film produced by the technique of chemical vapor deposition. It has a monoatomic thickness and, since there are no size limitations in the other dimensions (length and width), it can cover any required large surface areas.

The results from measurements performed in the above mentioned laboratories, showed that this membrane is impermeable to moisture, the oxidizing agents and other harmful pollutants and also

can absorb a large amount of harmful ultraviolet radiation. Finally, in contrast to other protective means, it is demonstrated that these graphene coatings are relatively easy to remove without damaging the surface of the artworks.

This research was published in *Nature Nanotechnology*.

More information: M. Kotsidi et al, Preventing colour fading in artworks with graphene veils, *Nature Nanotechnology* (2021). DOI: 10.1038/s41565-021-00934-z

Journal information: Nature Nanotechnology

https://phys.org/news/2021-07-graphene-paving-methods-art.html

COVID-19 Research News

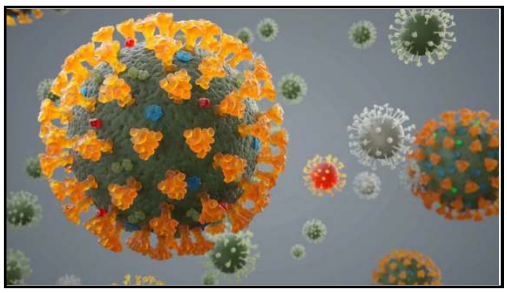
INDIA TODAY

Tue, 06 July 2021

Scientists find new post-infection treatment for Covid-19

Scientists have identified a post-infection treatment for SARS-CoV-2, the virus that causes Covid-19, and successfully demonstrated its efficacy in stopping viral reproduction in mice

Washington: Scientists have identified a post-infection treatment for SARS-CoV-2, the virus that causes COVID-19, and successfully demonstrated its efficacy in stopping viral reproduction in mice.



Scientists have identified a post-infection treatment for SARS-CoV-2. (Getty Images)

The study, published in the journal Proceedings of the National Academy of Sciences, shows that animal models infected with SARS-CoV-2 and treated with an inhibitor of protease enzymes had significantly increased survival and decreased lung viral quantity.

These protease inhibitors are a class of antiviral drugs that prevent viral reproduction by selectively binding to viral enzymes and blocking the activation of proteins that are necessary for the production of infectious viral particles.

"We developed the protease inhibitor GC376 for treating a fatal coronavirus infection in cats, which is now under commercial development as an investigational new animal drug," said Yunjeong Kim, associate professor at Kansas State University in the US.

"After COVID-19 emerged, many research groups reported that this inhibitor is also effective against the coronavirus that causes COVID-19, and many are currently pursuing the development of protease inhibitors as a treatment," Kim said.

The research team modified GC376 using a tool called deuteration to test its efficacy against SARS-CoV-2.

Treatment with a deuterated variant starting at 24 hours post-infection resulted in significantly increased survival of mice compared to untreated mice, the researchers said.

The results suggest that deuterated variants have excellent potential as antiviral agents against SARS-CoV-2, they said.

"Treating SARS-CoV-2-infected mice with deuterated GC376 significantly improved survival, viral replication in lungs and weight losses, which shows the efficacy of the antiviral compound," said Kyeong-Ok Chang, professor at Kansas State University.

"The results suggest deuterated GC376 has a potential for further development, and this deuteration method can be utilised to other antiviral compounds to generate potent inhibitors," Chang said.

The virologists are continuing to develop improved inhibitors using various methods. Deuterated GC376 is currently being evaluated for further potential development.

https://www.indiatoday.in/coronavirus-outbreak/story/scientists-find-new-post-infection-treatment-for-covid-1824049-2021-07-05