Sept
2021

समाचार पत्रों से चयित अंश
Newspapers Clippings

A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology

खंड : 46 अंक : 177 07 सितम्बर 2021

Vol.: 46 Issue : 177 07 September 2021

रक्षा विज्ञान पुस्तकालय
Defence Science Library
रक्षा वैज्ञानिक सूचना एवं प्रलेखन केंद्र
Defence Scientific Information & Documentation Centre
मेटकॉफ हाउस, दिल्ली - 110 054
Metcalfe House, Delhi - 110 054

CONTENTS

DRDO News

DRDO Technology News

Hindustan Times

Tue, 07 Sept 2021

Sea trials for floating missile test range INS Anvesh begin this month

The FTR will not only speed up the missile projects of DRDO but also allow live testing of interceptor missiles for phase II of Ballistic Missile Defence program

By Shishir Gupta

New Delhi: Sea trials of India's first floating missile test range (FTR), INS Anvesh, are set to begin this month with the ship expected to be commissioned in the next two months. Built by Cochin Shipyard and designed by the Defence Research and Development Organization (DRDO), the nearly 9000 tonne ship will be used to test missiles up to range of 1500 kilometers deep inside the Indian Ocean without the threat to population or sea traffic as well as land mass limitation.

India is expected to commission at least four ships this year.

India is expected to commission at least four ships this year with ballistic missile tracking ship INS Dhruv being handed over to National Research Technical Organization (NTRO) on September 10. Stealth guided missile destroyer INS Vishakapatnam and diesel attack submarine INS Vela, fourth of the Kalvari class, will also be commissioned by the end of the year.

Once commissioned, the FTR INS Anvesh will bring futuristic missile projects up to speed as it will provide for a ready-made safety corridor without going through the tedious exercise of issuing NOTAMs to ships and aircraft flying in the area. While the DRDO missile testing site at Wheeler Island off Odisha is under the scanner of the adversaries, the FTR will also allow discreet testing of missiles and torpedoes 400 to 500 nautical miles into the sea.

While only a select group of nations operate FTRs, the DRDO has specific plans to use the vessel, equipped with electro-optical missile tracking, S-band radar tracking, telemetry devices apart from a launch pad, control and mission control center, for testing its phase II of Ballistic Missile Defence (BMD) interceptor missiles. The phase II of the BMD envisages intercepting and destroying enemy missile up to range of 2000 kilometers by kinetic force with the FTR allowing live testing of the interdictor missiles and not computer simulations.

The FTR will also allow for live missile and torpedo firing by the Navy as well as surface-to-surface tactical missiles with the Indian Army.

https://www.hindustantimes.com/india-news/sea-trials-for-floating-missile-test-range-ins-anvesh-begin-this-month-101630984781024.html

RisingKashmir

Tue, 07 Sept 2021

KU, IUST jointly host webinar on extramural research opportunities with DRDO

Awantipora: Islamic University of Science & Technology (IUST) and University of Kashmir (KU) collaborated to host a webinar Monday with Directorate of Extramural Research & IPR support (ER & IPR) Defence Research and Development Organisation (DRDO) to create an awareness among faculty in the two Institutions about various extramural funding schemes offered by the DRDO.

DRDO, is a premier research and development organization under the Ministry of Defense that caters to development of defense technologies as per the existing and futuristic requirements of the country. It also supports academic institutions in their research pursuits.

The webinar, coordinated by the IUST, was attended by Vice Chancellor KU, Prof. Talat Ahmad and Vice Chancellor, IUST Prof. Shakil Ahmad Romshoo.

During his address, Prof. Talat Ahmad spoke about the need for partnering with national research institutes like DRDO for addressing issues of societal importance and human resource development in frontier areas of science and technology.

Prof. Romshoo highlighted the importance of building the technical ingenuity of the faculty in the two universities so that they are able to network with other national and international institutes to avail the funding opportunities in research and development available at the national and international level.

Both the Vice Chancellors emphasized the need of collaboration amongst University of Kashmir, IUST and other Universities within the UT of J&K for promoting high quality Research on issues of scientific and societal importance.

During the webinar, Dr. Shiv Kumar, Scientist 'G' & Director ER & IPR, DRDO made a detailed presentation about the Research opportunities supported by the DRDO for academic institutes in the country. He presented details of the schemes for establishing networks with Research Community in various Research Centers and Institutions so as to establish Center of Excellence within Academic Institutions. During his presentation, he showcased various products and patents nurtured by Institutions and developed by industry to meet DRDO's immediate and futuristic needs for defense product development and technologies.

He shortlisted the probable areas of Research Collaboration in Electronics, aeronautics, armaments, life sciences, new materials etc. while focusing on quantum computing, information security, sensor technologies & PV systems.

Dr. Kumar also highlighted the opportunities for Undergraduate, Postgraduate and Research Scholars to pursue their internship programs and research in the DRDO lab spread across the country. Towards the end, Dr. Shiv Kumar responded to a no. of queries raised by the faculty members of IUST & University of Kashmir related to various issues like signing of MoU, submission of Research Proposals, funding support, DRDO lab, IPR etc.

The webinar was attended by large no. of faculty from IUST and University of Kashmir including Deans of various schools, Heads of the Departments, and faculty members from both the Universities.

https://www.risingkashmir.com/-KU--IUST-jointly-host-webinar-on-extramural-research-opportunities-with-DRDO-91555

STAR OF MYSORE

Tue, 07 Sept 2021

AFST(I) hosts Memorial Lectures

28th ICFoST National Convention to be held in January, 2022

Mysore/Mysuru: Association of Food Scientists and Technologists-India (AFST-I) had organised the Dr. HAB Parpia Memorial Lecture, Shri GCP Rangarao Memorial Lecture and Curtain Raiser of 28th Indian Convention of Food Scientists and Technologists [ICFoST] in association with the CSIR-CFTRI and DRDO-DFRL, Mysuru, at IFTTC Auditorium in CSIR-CFTRI premises here recently.

Dr. Uday S. Annapure, President, AFST(I), welcomed the dignitaries and participants.

Dr. Sridevi Annapurna Singh, Director, CSIR-CFTRI, Mysuru, delivered the Dr. HAB Parpia Memorial Lecture on the topic 'Challenges and Scientific Solutions to Ensure Nutritional Security in Modern India.'

Dr. R. Kumar, Associate Director, DRDO-DFRL, Mysuru, delivered the Shri GCP Rangarao Memorial Lecture on the topic 'Space Foods.'

Dr. Vikas Singh Chauhan, Honorary Secretary, briefed about the 28th ICFoST to be organised from 20th to 22nd January 2022 at Aurangabad in Maharashtra on the theme 'Emerging and Adoptable Technologies for Sustainable Agro-Food industries and Economy (EAT-SAFE).' The 28th ICFoST will be organised in association with Mumbai and Aurangabad Chapters of AFST(I). The CSIR-CFTRI, Mysuru, DRDO-DFRL, Mysuru and ICT, Mumbai, will be the co-organisers.

As a curtain-raiser for the 28th ICFoST, Dr. Sridevi Annapurna Singh and Dr. R. Kumar unveiled the logo of the Convention and also released the first circular of the Convention.

In their remarks, Dr. Sridevi Annapurna Singh and Dr. Kumar appreciated the work done by the AFST(I) and wished the convention to be a grand success. Dr. Naveen Shivanna, Hon. Treasurer, proposed a vote of thanks.

The Central Executive Committee Members and dignitaries from CSIR-CFTRI and DRDO-DFRL were also present at the function. A large number of food scientists and technologists participated in the programme through virtual mode.

https://starofmysore.com/afsti-hosts-memorial-lectures/

The EurAsian Times

Tue, 07 Sept 2021

US, India ink landmark pact to develop next-gen drones in a whopping $20b overall military contract

By Parth Satam

With China as a common adversary, there are reports that India and the US will develop an air-launched drone that will be executed under the aegis of the Defence Technology and Trade Initiative (DTII).

IAF and USAF officials during the signing of the pact. (Image: USAF)

While the agreement was signed on July 30 this year, India's Ministry of Defence (MoD) disclosed this recently.

Termed as a landmark agreement by the US Air Force, the DTII becomes a part of expanding defense and strategic cooperation between two countries, which includes weapons sales worth around $20 billion and holding a host of naval and military exercises like Malabar, Quad, and Yudh Abhyas.

"The development is very significant at a time China has been increasingly flexing its muscle in the region. Considering China's aggressive posture, this agreement will pave the way for more cooperation in defense and security.

It will convey an unambiguous message about the growing relationship between India and the US," said an official from the Ministry of Defence (MoD).

The project agreement was signed between India's MoD and the US Department of Defence by the co-chairs of the Joint Working Group on Air Systems under the DTTI – Assistant Chief of Air Staff (Plans) Air Vice Marshal Narmdeshwar Tiwari and Air Force Security Assistance and Cooperation Directorate head, Brig. Gen. Brian R. Bruckbauer.

The Aeronautical Development Establishment (ADE) at DRDO and the Aerospace Systems Directorate at the US Air Force Research Laboratory (AFRL), along with the Indian and US air forces, are the principal organizations that would be involved in the project.

"The PA (preliminary agreement) outlines the collaboration between Air Force Research Laboratory, Indian Air Force, and Defence Research and Development Organisation towards design, development, demonstration, testing, and evaluation of systems to co-develop an ALUAV prototype," the MoD0 statement said.

The US Air Force said in a Twitter post, "#AirForce & @IAF_MCC signed a landmark agreement to co-develop Air-Launched UAVs under the U.S.-India Defense Technology & Trade Initiative. The agreement strengthens existing defense cooperation & advances our shared vision of Free and Open Indo-Pacific."

Air-Launched Drone

While there is little clarity on what the air-launched UAV (ALUAV) prototype would be capable of, it is expected to be primarily surveillance and reconnaissance-centric, networked with other assets, enhancing situational awareness.

If successful, it might be mass-produced for swarming enemy air defenses or drawing its fire. It is unclear if it would have a combat role of supporting ground troops or 'loyal wingman' mode of flying alongside strike or air dominance fighters.

These systems are seen as a way to counter integrated air defense networks deployed by potential rivals such as China and Russia.

The announcement comes amidst the Indian Army, the Navy, and the Air Force, signing multiple contracts worth Rs 500 crore for drone procurement with Indian companies.

The Army has signed three separate deals that include two worth over Rs 200 crore for swarm drones with Bengaluru-based startup NewSpace Research and Tech and Noida-based Raphe.

It has also ordered 100 tactical Israeli-origin kamikaze (suicide) drones – possibly Harop – that were used to devastating effect by Azerbaijan against Armenia in the Nagorno-Karabakh war in September 2020. They will be supplied over a period of 12 months and will be manufactured by a joint-venture by Israel's Elbit Systems and Bengaluru-based Alpha Design Technologies.

The Navy had also placed an order with defense PSU Bharat Electronics Limited (BEL) for the supply of Naval Anti Drone System (NADS), developed by the Defence Research and Development Organisation (DRDO). The Indian Air Force, meanwhile, signed a deal with Indian firm Zen Technologies for counter unmanned aerial systems.

The main aim of the DTTI is to bring sustained leadership focus to promote collaborative technology exchange and create opportunities for the co-development of future technologies for Indian and US military forces.

Under the DTTI, joint working groups on land, naval, air, and aircraft carrier technologies have been established to focus on mutually agreed projects in respective domains.

The PA for ALUAV falls under the research, development, testing, and evaluation (RDT&E) memorandum of agreement between the MoD and US Department of Defence, which was first signed in January 2006 and renewed in January 2015.

"The agreement is a significant step towards deepening defense technology collaboration between the two nations through co-development of defense equipment," the MoD statement added.

Concerns Over Joint Development Projects

There are three other service-led Joint Working Groups, namely Land Systems, Naval Systems, and Aircraft Carrier Technology Cooperation.

However, a major camp in the Indian defense establishment is wary of the project actually taking off under a co-development format, given the history of US arms makers refusing to share technology and many such projects under the DTTI actually being dropped previously.

The biggest was India and the US suspending collaboration on jet engine development under the DTTI, which was announced by former Under Secretary of Defence Ellen Lord in October 2019. The JWG on Jet Engine Technology was seen by India as a pathway to develop a world-class engine for its under-development fifth-generation Advanced Medium Combat Aircraft (AMCA).

India's own Kaveri had been failing to be able to develop the requisite power, and was missing the 'hot engine' capability, considered a hallmark of a reliable jet engine. This had led to a perception that the DTTI was merely the "venue of fast-tracking sole-source contracts on major defense articles" instead of ToT collaboration.

Moreover, four other 'pathfinder' projects had failed to take off. They were the next-generation mini-UAVs that were rejected by the Indian Army for being too low-tech; roll-on roll-off kits for C-130; mobile electric hybrid power source and; a protector kit for nuclear biological chemical fallout. The India Rapid Reaction Cell set up by the Pentagon was also downsized.

https://eurasiantimes.com/us-india-ink-landmark-pact-to-develop-next-gen-drones-in-a-whopping-20b-military-contract/

Defence News

Defence Strategic: National/International

Press Information Bureau
Government of India

Ministry of Defence

Mon, 06 Sept 2021 2:33PM

President's colour presented to naval aviation

- ***Naval Aviation has distinguished itself with exceptional service to the Nation over the last seven decades***
- ***The Naval Aviation Arm came into being in 1951 and now has over 250 aircraft***
- ***The President recalled the glorious contribution of INS Vikrant during the liberation of Bangladesh***
- ***The President lauded the indigenisation efforts of the Indian Navy in keeping with the Atma Nirbhar Bharat vision of the Government***

Shri Ram Nath Kovind, the Hon'ble President of India and the Supreme Commander of Indian Armed Forces, presented the President's Colour to Indian Naval Aviation at INS Hansa, Goa on 06 Sep 2021. To mark the momentous occasion, a ceremonial parade with a 150-men Guard of Honour was presented to the President. Shri PS Sreedharan Pillai, the Governor of Goa; Dr Pramod Sawant, Chief Minister of Goa; Shri Shripad Yesso Naik, Minister of State for Tourism, Ports Shipping and Waterways; Admiral Karambir Singh, Chief of Naval Staff; Vice Admiral R Hari Kumar, Flag Officer Commanding-in-Chief Western Naval Command and Rear Admiral Philipose G Pynumootil, Flag Officer Naval Aviation along with other civil and military dignitaries attended the ceremony.

The President's Colour is bestowed on a military unit, in recognition of exceptional service rendered to the Nation, both in peace and in war. Naval Aviation has distinguished itself with notable and gallant service to our Nation over the past seven decades. The Indian Navy was the first Indian Armed Force, to receive the President's Colour, from Dr Rajendra Prasad, the then President of India on 27 May 1951. Subsequent recipients of the President's Colour in the Navy include Southern Naval Command, Eastern Naval Command, Western Naval Command, Eastern Fleet, Western Fleet, Submarine Arm, INS Shivaji and the Indian Naval Academy.

Award of the President's Colour to Indian Naval Aviation, is in recognition of the yeoman service rendered both during peace and combat. The arm came into being with acquisition of the first *Sealand* aircraft on 13 Jan 1951 and commissioning of INS Garuda, at Kochi on 11 May 1953.

Today, Naval Aviation boasts of nine Air Stations and three Naval Air Enclaves, along the Indian coastline and the Andaman and Nicobar Islands. Over the past seven decades, it has transformed into a modern, technologically advanced and highly potent force, with more than 250 aircraft comprising Fighters, Maritime Reconnaissance Aircraft, Helicopters and Remotely Piloted Aircraft (RPA). Today, Naval Aviation assets are capable of undertaking missions along the entire gamut of military operations. Naval Aviation is a vital component of the main roles of Indian Navy - Military, Diplomatic, Constabulary and Benign.

Speaking on the occasion, the President recalled the glorious contribution of INS Vikrant with its integral aircraft, which played a crucial role in liberation of Bangladesh in 1971. The President added that, Naval aircraft have also been at the forefront of numerous peacetime as well as Humanitarian Assistance and Disaster Relief operations, providing relief not only to our countrymen but also to friendly foreign nations. The President lauded the indigenisation efforts of the Indian Navy in keeping with the *Atma Nirbhar Bharat* vision of the Government. The President also made a mention of the significant progress made in aviation technology, facilitation of state-of-the-art indigenous weapons, sensors and data suites for Naval aircraft.

The President congratulated the officers and sailors on the momentous occasion and added that, Naval Aviation has come of age with the perseverance of the National Leadership. He also congratulated all veteran and serving Naval Aviators, for their selfless service to the Nation.

https://pib.gov.in/PressReleasePage.aspx?PRID=1752528

पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Mon, 06 Sept 2021 2:33PM

राष्ट्रपति ने नेवल एविएशन को ध्वज प्रदान किया

- ***नेवल एविएशन ने पिछले सात दशकों में राष्ट्र के लिए असाधारण सेवा के साथ खुद को प्रतिष्ठित किया है***
- ***नेवल एविएशन आर्म 1951 में अस्तित्व में आई और अब उसके पास 250 से अधिक विमान हैं***
- ***राष्ट्रपति ने बांग्लादेश की मुक्ति के दौरान आईएनएस विक्रांत के गौरवशाली योगदान को याद किया***
- ***राष्ट्रपति ने सरकार के आत्मनिर्भर भारत के दृष्टिकोण को ध्यान में रखते हुए भारतीय नौसेना के स्वदेशीकरण के प्रयासों की सराहना की***

राष्ट्रपति और भारतीय सशस्त्र बलों के सर्वोच्च कमांडर श्री राम नाथ कोविंद ने 06 सितंबर 2021 को आईएनएस हंस, गोवा में भारतीय नेवल एविएशन को ध्वज प्रदान किया। इस महत्वपूर्ण अवसर पर, 150 सैनिकों की एक समारोहपूर्ण परेड ने राष्ट्रपति को सलामी दी। गोवा के राज्यपाल श्री पी एस श्रीधरन पिल्लै, गोवा के मुख्यमंत्री डॉ प्रमोद सावंत, पर्यटन, पोत परिवहन और जलमार्ग राज्य मंत्री श्री श्रीपद येसो नाइक, नौसेनाध्यक्ष एडमिरल करमबीर सिंह, पश्चिमी नौसेना कमान के फ्लैग ऑफिसर कमांडिंग इन चीफ वाइस एडमिरल आर हरि कुमार और फ्लैग ऑफिसर नेवल एविएशन रियर एडमिरल फिलिपोज जी प्युनुमूटिल के साथ-साथ अन्य नागरिक और सैन्य गणमान्य व्यक्ति इस समारोह में शामिल हुए।

शांति और युद्ध दोनों में राष्ट्र को दी गई असाधारण सेवा के सम्मान में, एक सैन्य इकाई को राष्ट्रपति का ध्वज प्रदान किया जाता है। नेवल एविएशन ने पिछले सात दशकों में हमारे राष्ट्र के लिए उल्लेखनीय और वीरतापूर्ण सेवा के साथ खुद को प्रतिष्ठित किया है। भारतीय नौसेना 27 मई 1951 को भारत के तत्कालीन राष्ट्रपति डॉ राजेंद्र प्रसाद से ध्वज प्राप्त करने वाली पहली भारतीय सशस्त्र सेना थी। इसके बाद

नौसेना में राष्ट्रपति का ध्वज प्राप्त करने वालों में दक्षिणी नौसेना कमान, पूर्वी नौसेना कमान, पश्चिमी नौसेना कमान, पूर्वी बेड़ा, पश्चिमी बेड़ा, पनडुब्बी शाखा, आईएनएस शिवाजी और भारतीय नौसेना अकादमी शामिल हैं।

शांति और युद्ध दोनों के दौरान प्रदान की गई विशिष्ट सेवा की मान्यता के लिए भारतीय नेवल एविएशन को ध्वज प्रदान किया गया है। यह शाखा 13 जनवरी 1951 को पहले सीलैंड विमान के अधिग्रहण के साथ अस्तित्व में आई और 11 मई 1953 को कोच्चि में आईएनएस गरुड़ को इसमें शामिल किया गया। आज नेवल एविएशन में भारतीय समुद्र तट के साथ अंडमान व निकोबार द्वीप समूह के नौ वायु स्टेशनों और तीन नौसेना वायु एन्क्लेव को मजबूती प्रदान करता है। पिछले सात दशकों में, यह एक आधुनिक, तकनीकी रूप से उन्नत और अत्यधिक शक्तिशाली बल में बदल गया है, जिसमें लड़ाकू विमान, समुद्री टोही विमान, हेलीकॉप्टर और दूर-संचालित विमान (आरपीए) सहित 250 से अधिक विमान शामिल हैं। आज नेवल एविएशन अपने संसाधनों के बल पर सभी प्रकार के सैन्य अभियानों के संचालन में सक्षम है। नेवल एविएशन भारतीय नौसेना की मुख्य भूमिकाओं - सैन्य, राजनयिक, कांस्टेबुलरी और हितकारी - का एक महत्वपूर्ण घटक है।

इस अवसर पर राष्ट्रपति ने आईएनएस विक्रांत के इंटिग्रल विमान के साथ गौरवशाली योगदान को याद किया, जिसने 1971 में बांग्लादेश की मुक्ति में महत्वपूर्ण भूमिका निभाई थी। राष्ट्रपति ने कहा कि नौसेना के विमान भी अनेक शांतिकाल के साथ-साथ न केवल हमारे देशवासियों को बल्कि मित्र विदेशी राष्ट्रों को भी मानवीय सहायता और आपदा राहत अभियान, राहत प्रदान करने में सबसे आगे रहे हैं। राष्ट्रपति ने सरकार के आत्मनिर्भर भारत के दृष्टिकोण को ध्यान में रखते हुए भारतीय नौसेना के स्वदेशीकरण के प्रयासों की सराहना की। राष्ट्रपति ने विमानन प्रौद्योगिकी में की गई महत्वपूर्ण प्रगति, नौसेना के विमानों के लिए अत्याधुनिक स्वदेशी हथियारों, सेंसर और डेटा सूट की सुविधा का भी उल्लेख किया।

राष्ट्रपति ने इस महत्वपूर्ण अवसर पर अधिकारियों और नाविकों को बधाई दी और कहा कि राष्ट्रीय नेतृत्व की दृढ़ता के साथ नेवल एविएशन सशक्त हो गया है। उन्होंने राष्ट्र के प्रति निस्वार्थ सेवा के लिए सभी अनुभवी और सेवारत नौसेना एविएटरों को भी बधाई दी।

https://pib.gov.in/PressReleasePage.aspx?PRID=1752586

Press Information Bureau
Government of India

Ministry of Defence

Mon, 06 Sept 2021 4:18PM

Royal Australian Navy and Indian Navy commence bilateral exercise – 'AUSINDEX'

Indian Navy Task Group comprising *IN* Ships *Shivalik* and *Kadmatt*, under the Command of Flag Officer Commanding, Eastern Fleet, Rear Admiral Tarun Sobti, VSM is participating in the 4th edition of AUSINDEX from 06 to 10 Sep 21. Royal Australian Navy (RAN) Anzac Class Frigate, HMAS *Warramunga* which participated in Exercise MALABAR along with the *IN* units is also part of the exercise. This edition of AUSINDEX includes complex surface, sub-surface and air operations between ships, submarines, helicopters and Long Range Maritime Patrol Aircraft of the participating Navies.

The participating Indian Naval Ships *Shivalik* and *Kadmatt* are the latest indigenously designed and built Guided Missile Stealth Frigate and Anti-Submarine Corvette respectively. They form part of the Indian Navy's Eastern Fleet based at Visakhapatnam under the Eastern Naval Command.

Commenced in 2015 as a bilateral *IN*-RAN maritime exercise, AUSINDEX has grown in complexity over the years and the 3rd edition of the exercise, held in 2019 in the Bay of Bengal, included anti-submarine drills for the first time.

In the Fourth Edition, the surface units of both the countries will be exercising with HMAS Rankin, a Collins Class Australian Submarine, Royal Australian Air Force P-8A and F-18A aircraft, along with integral helicopters of both the Navies. The exercise will provide an opportunity for both Navies to further bolster inter-operability, gain from best practices and develop a common understanding of procedures for Maritime Security Operations.

The exercise is a true representation of Joint Guidance signed by the Chief of the Naval Staff, *IN* and Chief of Navy, RAN on 18 Aug 21. This important document is aligned to the '2020 Comprehensive Strategic Partnership' between the two nations and aims to further consolidate shared commitment to regional and global security challenges promoting peace, security and stability in the Indo-Pacific region. The conduct of this exercise despite COVID restrictions is also a testimony of existing synergy between the participating Navies.

https://pib.gov.in/PressReleasePage.aspx?PRID=1752545

NEWS18

Tue, 07 Sept 2021

Exclusive | In Key reforms, IAF may soon be able to hire mid-air refuelling aircraft for emergency situations

The air force will get the powers for first time under the Delegation of Financial Powers to Defence Services, which is undergoing a revision in view of emerging security threats and is likely to be released shortly

The Indian Air Force (IAF) is likely to get financial powers to hire aircraft, including mid-air refuellers, and related equipment for short term in order to address operational emergencies, top defence sources have said, in a move that could cut down on tedious paperwork during crunch situations.

IAF's Mirage 2000 fighter gets mid air fuelling from IL-78 planes as they take part during an exercise at Pokhran firing range in Rajasthan in 2004. (File photo/Reuters)

The financial powers that IAF is likely to get for the first time are part of larger reforms by the defence ministry and will help the force obtain critical air assets from private players — and even foreign governments — in a short time frame and for a short duration in case of contingencies, the sources said.

"This is particularly important in the wake of the dwindling defence budget. Any major procurement is a long and a tedious process requiring multiple clearances," a senior defence officer, who spoke on condition of anonymity, told News18.com.

Mid-air refuellers act as a force multiplier and add strategic heft to any air force by letting an aircraft stay longer in the air. Though IAF operates a fleet of six Russian IIyushin-78 refuelling tankers, they are facing service issues.

The financial powers, which could allow IAF to spend between Rs 100 crore and Rs 200 crore in each case, will stem from the Delegation of Financial Powers to Defence Services (DFPDS), which is undergoing revisions and likely to be released shortly.

DFPDS is the document that governs all defence revenue procurements by identifying competent financial authorities and financial powers accorded to them.

While capital procurements refer to the acquisition of major capital assets, weapons or weapon systems and other critical equipment that enhance long-term capabilities of the armed forces, revenue purchases, among others, are related to the procurement of critical spares and ammunition required for the maintenance of these capital assets.

Capital procurements are governed by the Defence Acquisition Procedure (DAP), which was released in September 2020.

The ongoing revision of DFPDS, which was last notified in 2016, is a major reform by the defence ministry in view of emerging security threats and the need for faster and easier procurements of critical machinery to keep the forces keep operation-ready.

Hurdles in the past

IAF has made at least two unsuccessful attempts since 2007 to procure mid-air refuelling aircraft. Both tenders were scrapped because of pricing complications.

Even as a third procurement attempt was being considered, IAF had been simultaneously looking at getting refuelling aircraft from foreign players on lease.

A second officer explained that leasing, too, was an expensive exercise under DAP 2020.

"Moreover, in leasing, maintenance of the asset becomes our responsibility. This may not be the case with hiring them," this officer said.

"We will need to wait and see the hiring business solutions being offered by the industry. IAF can also enter into hiring contracts with other governments," the officer added.

The Indian Navy has the financial powers for hiring vessels, boats and associated equipment for harbour patrols, force protection and coastal security, among others.

Sources News18.com spoke to also said IAF's financial powers might increase by up to three times for indigenisation, and research and development in the revised DFPDS, which could include design and development of critical equipment. This would be in line with the central government's flagship Atmanirbhar Bharat project.

In May 2021, the defence ministry came out with a second "Positive Indigenisation List" of 108 items, including single-engine light helicopters and mini drones. These will be procured from indigenous sources.

https://www.news18.com/news/india/exclusive-in-key-reforms-iaf-will-soon-be-able-to-hire-mid-air-refuelling-aircraft-for-emergency-situations-4171046.html

Tue, 07 Sept 2021

Exclusive: नए सुधार से IAF की बढ़ेंगी वित्तीय शक्तियां, मिले इमरजेंसी हालात से निपटने के उपाय

नए रक्षा सुधारों (News Defence Reforms) के तहत वायुसेना (India Airforce) को ऐसी वित्तीय शक्तियां मिल जाएंगी जिससे इमरजेंसी हालात के वक्त भारी-भरकम कागजी कार्रवाई से बचा जा सकेगा।

नई दिल्ली: भारतीय वायुसेना (Indian Air Force) जल्द ही इमरजेंसी हालात (Emergency Situation) में हवा में ईंधन भरने वाले एयरक्राफ्ट किराए पर ले सकेगी। इसकी जानकारी न्यूज़18 को शीर्ष रक्षा सूत्रों के जरिए मिली है। दरअसल वायुसेना ऐसा नए रक्षा सुधार की वजह से कर सकेगी। माना जा रहा है कि इस फैसले की वजह से इमरजेंसी हालात में भारी-भरकम कागजी कार्रवाई से बचा जा सकेगा। ये वित्तीय शक्ति वायुसेना को रक्षा मंत्रालय द्वारा किए गए नए सुधारों की वजह से मिल रही है।

इस वत्तीय शक्ति की वजह से वायुसेना इमरजेंसी हालात में प्राइवेट प्लेयर्स से भी मदद ले सकेगी। यहां तक कि जरूरत पड़ने पर वायुसेना विदेशी सरकारों से भी मदद ले सकेगी। सूत्रों का कहना है कि ये मदद एक तय समयसीमा के लिए ही होगी और केवल इमरजेंसी हालात में इस्तेमाल की जा सकेगी। रक्षा क्षेत्र से जुड़े एक अधिकारी ने नाम न छापने की शर्त पर बताया - ऐसा सिकुड़ते रक्षा बजट की वजह से किया जा रहा है। कोई भी रक्षा खरीद करना एक लंबी और थकाऊ प्रक्रिया होती है। और इसमें कई तरह के क्लियरेंस की आश्यकता पड़ती है।

बढ़ेगी वायुसेना की शक्ति, मिटेंगे झंझट

हवा में ईंधन भरने वाले एयरक्राफ्ट सेना की शक्ति को बढ़ाने के साथ रणनीतिक शक्ति में भी इजाफा करते हैं। अगर ये एयरक्राफ्ट मौजूद हों तो अन्य विमानों को हवा में ज्यादा देर तक बने रहने में मदद मिलती है। हालांकि अभी भारतीय वायुसेना के पास 6 रूसी Ilyushin-78 टैंकर्स हैं लेकिन इनमें अभी सर्विस का मुद्दा है।

वायुसेना इमरजेंसी मामलों में 100 से 200 करोड़ तक खर्च कर सकती है

नए सुधार के वजह से वायुसेना इमरजेंसी मामलों में 100 से 200 करोड़ तक खर्च कर सकती है। इन नए सुधारों पर विचार जारी है और जल्द ही इन्हें रिलीज किया जा सकता है। इसका नाम डेलीगेशन फाइनेंशियल पावर्स टू डिफेंस सर्विस (DFPDS) है। DFPDS एक ऐसा डॉक्यूमेंट है जो सभी रक्षा राजस्व खरीद को गवर्न करता है।

https://hindi.news18.com/news/nation/exclusive-in-key-reforms-iaf-will-soon-be-able-to-hire-mid-air-refuelling-aircraft-for-emergency-situations-3729955.html

THE HINDU

Tue, 07 Sept 2021

IAF plane with Rajnath, Gadkari to conduct mock emergency landing on highway in Rajasthan's Barmer

According to sources, the two Ministers will be inaugurating the 3.5 km-long strip on the NH in Barmer this week as it is ready to handle emergency landings

A plane of the Indian Air Force (IAF), carrying Defence Minister Rajnath Singh and Road Transport and Highways Minister Nitin Gadkari, will conduct a mock emergency landing on a national highway in Rajasthan's Barmer this week, sources said on Monday.

Indian Air Force's fighter jets. File | Photo Credit: MURALI KUMAR K

The two Ministers will be inaugurating the 3.5 km-long strip on the national highway in Barmer this week as it is ready to handle emergency landings of the IAF's fighter jets and other aircraft, sources mentioned.

It is India's first national highway to be used for emergency landing of IAF aircraft, they added.

In October 2017, fighter jets and transport planes of the IAF had conducted mock landings on the Lucknow-Agra Expressway to show that such highways can be used by the IAF planes for landing in case of an emergency.

The Lucknow-Agra Expressway comes under the Uttar Pradesh government.

According to the sources, officials of the National Highways Authority of India (NHAI) worked in coordination with IAF officials to develop the airstrip on the national highway in Barmer.

They said at least 12 national highways across the country — apart from the aforementioned one in Barmer — are being readied so that they can be used as airstrips by the IAF planes in an emergency situation.

The parts of the 12 national highways that will be used as airstrips are being identified and prepared, sources added.

https://www.thehindu.com/news/national/other-states/iaf-plane-with-rajnath-gadkari-to-conduct-mock-emergency-landing-on-highway-in-rajasthans-barmer/article36314993.ece

THE TIMES OF INDIA

Tue, 07 Sept 2021

India, Australia to boost ties in first 2+2 ministerial talks this week

By Rajat Pandit

New Delhi: India and Australia plan to further crank up their bilateral defence ties with more combat exercises, strengthening cooperation on maritime security and intelligence-sharing, even as they also work together with the US and Japan in the 'Quad' strategic grouping in face of China's aggressive behaviour in the Indo-Pacific.

Indian Navy Task Group comprising INS Shivalik and INS Kadmatt, under the command of Indian Eastern Fleet commander Rear Admiral Tarun Sobti, participates in the fourth edition of Ausindex.

Defence minister Rajnath Singh will meet his Australian counterpart Peter Dutton on Friday in New Delhi to discuss specific measures to further expand the bilateral defence cooperation. This will be followed by the two defence ministers joining foreign minister S Jaishankar and his counterpart Marise Payne for the first 'two-plus-two' ministerial dialogue between the two countries on Saturday.

"Defence Ties with Australia have gained a lot of momentum after the relationship was upgraded to a 'Comprehensive Strategic Partnership' in June 2020. Several new steps and exchanges are being discussed," an official said on Monday.

With Australia now becoming a permanent member of the quadrilateral 'Malabar' naval exercise, the 25th edition of which was conducted off Gaum in the western Pacific late last month, Dutton is very keen on India joining his country's largest biennial wargames called 'Talisman Sabre' in 2023, as was earlier reported by TOI. Australia believes it will further consolidate the Quad, which has declared its firm intent to deter any "coercion" in the Indo-Pacific, since the exercise already features the US and Japan as well as other countries like the UK, Canada, South Korea and New Zealand.

On Monday, India and Australia also kicked off the 4th edition of their naval drills 'Ausindex' off Darwin. While India has deployed guided-missile frigate INS Shivalik and anti-submarine warfare corvette INS Kadmatt for the exercise, Australia is taking part with frigate HMAS Warramunga and submarine HMAS Rankin as well as F-18A fighter jets and P-8A maritime patrol aircraft.

"Australia and India are comprehensive strategic partners. We share a commitment to increasing the regularity and complexity of our military training so we can be confident in our ability to work effectively to respond to the maritime security needs in our region," said Australian fleet commander Rear Admiral Mark Hammond.

"Each time our nations come together, we develop further maritime interoperability by exercising more involved warfare serials demonstrating our strong commitment to an open, secure and prosperous Indo-Pacific region," he added.

Indian Eastern Fleet commander Rear Admiral Tarun Sobti, in turn, said, "This exercise will further strengthen the partnership and interoperability with the Australian navy in the Indo-Pacific. We're looking forward to adopting the best practices and building on the warfare training standards achieved in the Malabar drills."

https://timesofindia.indiatimes.com/india/india-australia-to-boost-ties-in-first-22-ministerial-talks-this-week/articleshow/85992742.cms

The Indian EXPRESS

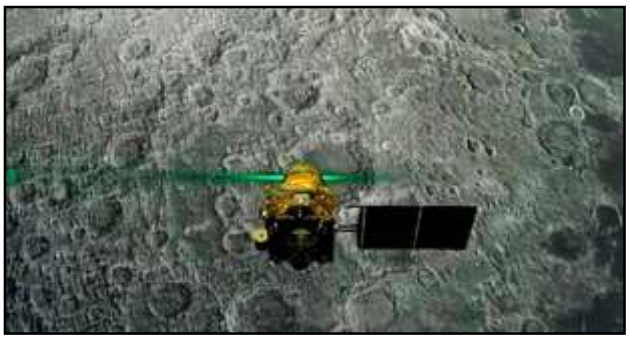
Tue, 07 Sept 2021

ISRO: Chandrayaan-2 detects chromium, manganese through remote sensing

India's Chandrayaan-2 spacecraft, which has completed more than 9,000 orbits around the Moon, has detected minor elements of chromium and managanese through remote sensing, officials of the Indian Space Research Organisation (ISRO) said on Monday. At a two-day lunar science workshop livestreamed on Facebook and YouTube, marking the completion of two years of the second […]

By Sohini Ghosh

Ahmedabad: India's Chandrayaan-2 spacecraft, which has completed more than 9,000 orbits around the Moon, has detected minor elements of chromium and managanese through remote sensing, officials of the Indian Space Research Organisation (ISRO) said on Monday.



The presence of the elements on the lunar surface was known so far through soil samples collected during earlier moon missions. (PTI)

At a two-day lunar science workshop livestreamed on Facebook and YouTube, marking the completion of two years of the second Moon mission launched on July 22, 2019, ISRO Chairman K Sivan said Chandrayaan-2 data is "national property" and implored the scientific and academia community to utilise the same for furthering science.

Sivan, who is also the secretary of Department of Space, released the science and data product documents from the mission output so far.

One of the sessions discussed payload results of Chandrayaan-2 Large Area Soft X-Ray Spectrometer (CLASS) measures the Moon's X-ray Fluorescence (XRF) spectra to examine the presence of major elements such as magnesium, aluminium, silicon, calcium, titanium, iron, and sodium. Discussing the science results from it, principal investigator Shyama Narendranath, of CLASS payload stated that it has seen "definite detection of (minor elements) chromium and manganese for the first time (from the lunar surface through remote sensing), which was a surprise as these (elements) are less than one weight percentage on the moon".

The two elements were detected at few places during intense solar flare events. The presence of the elements on the lunar surface was known so far through soil samples collected during earlier moon missions.

According to a statement from ISRO, the eight payloads onboard Chandrayaan-2 are conducting scientific observations of the Moon by remote sensing and in-situ techniques.

The first day of the workshop highlighted some of the distinguishing features of the payloads onboard the orbiter, an overview of the mission and scientific findings so far, payload operations, as well as detailed presentations on the science results from four of the eight payloads. Science results from the remaining four payloads are scheduled for discussion on Tuesday.

CLASS payload has also been able to remove ambiguities while detecting sodium in lunar surface. Although sodium was detected based on Chandrayaan-1 data, as published in a 2014 paper, the detection also held some uncertainties.

CLASS has also managed to obtain the first set of direct elemental abundances from all major elements "which makes up more than 99 per cent of all lunar surface", according to Narendranath. Elements detected include oxygen, aluminium, silicon, calcium, titanium and iron. Sivan released three documents — 'Handbook of Chandrayaan 2 Payloads Data & Science', 'Science Results from Chandrayaan-2 Mission' and 'Chandrayaan-2 Orbiter Payloads and Data Products'.

While Chandrayaan-2 had failed its soft landing maneuver, thus losing the lander and rover and the associated five payloads, the orbiter with eight payloads onboard for mapping the lunar surface and outer atmosphere of the Moon, has successfully continued to send back data and is expected to be in operation for seven years after its launch.

Speaking from ISRO headquarters in Bengaluru, Sivan said that Chandrayan-2 can help us understand the evolution of the inner solar system as the Moon, being an airless celestial body, has preserved the signatures of the events that took place in the early years of the solar system.

"The results are very much encouraging… Students, faculty members, and scientists from colleges, universities and scientific institutes will be able to access and analyse the Chandrayaan-2 orbiter payloads' data and add value to the mission. Participation of scientifically motivated minds from academia and institutes is highly solicited… (This) data is national property… and I want the entire scientific community across the country to make use of this data and discover new science which nobody else has done," said Sivan.

Chairman of Apex Science Board and former ISRO chairman AS Kiran Kumar remarked that the satellite has been providing "excellent data" over the past two years. "Only when we start doing more and more intense data analysis, can we do justice to the mission of Chandrayaan-2…" The Chandrayaan-2 Orbiter payloads' data are available in the public domain through the host website pradan.issdc.gov.in and more data sets will be added as acquired by various payloads, over time.

https://indianexpress.com/article/cities/ahmedabad/isro-chandrayaan-2-detects-chromium-manganese-through-remote-sensing-7493313/

PHYS.ORG

Tue, 07 Sept 2021

Researchers reveal a novel metal where electrons flow with fluid-like dynamics

A team of researchers from Boston College has created a new metallic specimen where the motion of electrons flows in the same way water flows in a pipe—fundamentally changing from particle-like to fluid-like dynamics, the team reports in *Nature Communications*.

A small crystal of the new material, a synthesis of Niobium and Germanium (NbGe2), is mounted on a device to examine the behavior of the new electron-phonon liquid. The inset shows the atomic arrangement in the material. Credit: Fazel Tafti, Boston College

Working with colleagues from the University of Texas at Dallas and Florida State University, Boston College Assistant Professor of Physics Fazel Tafti found in the metal superconductor, a synthesis of Niobium and Germanium ($NbGe_2$), that a strong interaction between electrons and phonons alters the transport of electrons from the diffusive, or particle-like, to hydrodynamic, or fluid-like, regime.

The findings mark the first discovery of an electron-phonon liquid inside $NbGe_2$, Tafti said.

"We wanted to test a recent prediction of the 'electron-phonon fluid'," Tafti said, noting that phonons are the

vibrations of a crystal structure. "Typically, electrons are scattered by phonons which leads to the usual diffusive motion of electrons in metals. A new theory shows that when electrons strongly interact with phonons, they will form a united electron-phonon liquid. This novel liquid will flow inside the metal exactly in the same way as water flows in a pipe."

By confirming the predictions of theoreticians, the experimental physicist Tafti—working with his Boston College colleague Professor of Physics Kenneth Burch, Luis Balicas of FSU, and Julia Chan of UT-Dallas—says the discovery will spur further exploration of the material and its potential applications.

Tafti noted that our daily lives depend on the flow of water in pipes and electrons in wires. As similar as they may sound, the two phenomena are fundamentally different. Water molecules flow as a fluid continuum, not as individual molecules, obeying the laws of hydrodynamics. Electrons, however, flow as individual particles and diffuse inside metals as they get scattered by lattice vibrations.

The team's investigation, with significant contributions from graduate student researcher Hung-Yu Yang, who earned his doctorate from BC in 2021, focused on the conduction of electricity in the new metal, $NbGe_2$, Tafti said.

They applied three experimental methods: electrical resistivity measurements showed a higher-than-expected mass for electrons; Raman scattering showed a change of behavior in the vibration of the $NbGe_2$ crystal due to the special flow of electrons; and X-ray diffraction revealed the crystal structure of the material.

By using a specific technique known as the "quantum oscillations" to evaluate the mass of electrons in the material, the researchers found that the mass of electrons in all trajectories was three times larger than the expected value, said Tafti, whose work is supported by the National Science Foundation.

"This was truly surprising because we did not expect such 'heavy electrons' in a seemingly simple metal," Tafti said. "Eventually, we understood that the strong electron-phonon interaction was responsible for the heavy electron behavior. Because electrons interact with lattice vibrations, or phonons, strongly, they are 'dragged' by the lattice and it appears as if they have gained mass and become heavy."

Tafti said the next step is to find other materials in this hydrodynamic regime by leveraging the electron-phonon interactions. His team will also focus on controlling the hydrodynamic fluid of electrons in such materials and engineering new electronic devices.

More information: Evidence of a coupled electron-phonon liquid in $NbGe_2$, *Nature Communications* (2021). DOI: 10.1038/s41467-021-25547-x

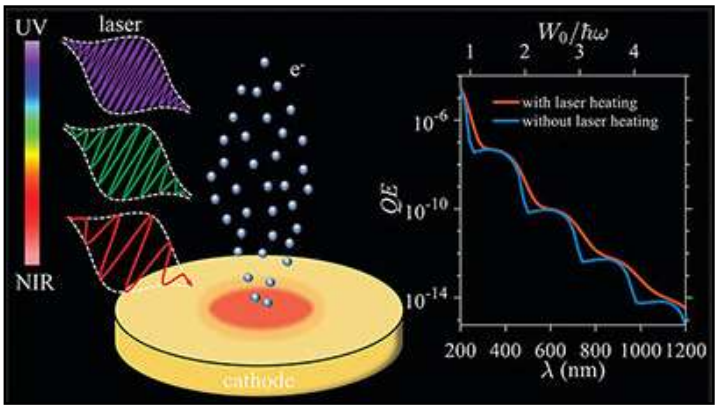
Journal information: *Nature Communications*

https://phys.org/news/2021-09-reveal-metal-electrons-fluid-like-dynamics.html

Tue, 07 Sept 2021

Enhancing photoelectric efficiency

Albert Einstein might have called this research at Michigan State University a much-needed study. Einstein won a Nobel Prize in Physics in 1921 for explaining the photoelectric effect.



Peng Zhang and Yang Zhou are working to improve the quantum efficiency of photoemission. Credit: Michigan State University

New research in the MSU College of Engineering may soon guide the development of better X-rays for everyday health or improving the space satellites consumers rely on every day.

Peng Zhang, associate professor of electrical and computer engineering, said that in simple terms the advancement involves ways that light dances on hard surfaces. "When light impinges on material surfaces, it can cause the ejection of electrons from the surface—a phenomenon known as the photoelectric effect. High quality electron beams for tabletop particle accelerators, intense X-rays, high-resolution electron microscopes, and high power high speed electronics need light induced electron emissions," he explained.

So Zhang and Ph.D. student Yang Zhou studied and analyzed photoemissions from metal surfaces using laser illumination. Their theoretical tests used ultraviolet wavelengths that ranged from 200 nanometers to near-infrared wavelengths of 1200 nanometers.

"Our results could help guide the development of highly efficient and bright photoelectron sources," Zhang said. "That means improvements in devices and systems including signal amplifiers in radars and satellites for space-based communications to better medical imaging for daily health."

Their research is currently featured in an article, "Quantum model considers the effect … on photoemission," in the American Institute of Physics *Scilight*, and "Quantum efficiency of photoemission from biased metal surfaces with laser wavelengths from UV to NIR" in the *Journal of Applied Physics* (2021).

More information: Chris Patrick, Quantum model considers the effect of laser wavelength, intensity, and DC bias on photoemission, *Scilight* (2021). DOI: 10.1063/10.0005951

Yang Zhou et al, Quantum efficiency of photoemission from biased metal surfaces with laser wavelengths from UV to NIR, *Journal of Applied Physics* (2021). DOI: 10.1063/5.0059497

Journal information: *Journal of Applied Physics*

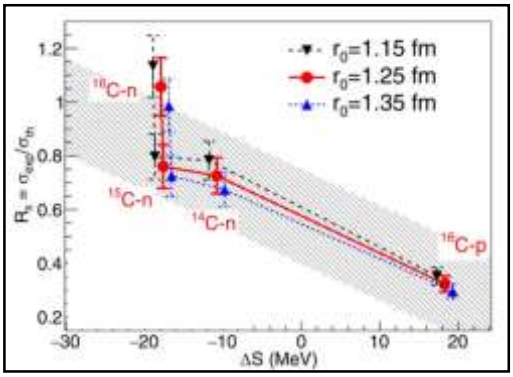
https://phys.org/news/2021-09-photoelectric-efficiency.html

Tue, 07 Sept 2021

Researchers obtain new results on knockout reactions at HIRFL-CSR

By Zhang Nannan

Researchers from the Institute of Modern Physics (IMP) of the Chinese Academy of Sciences (CAS) and their collaborators have systematically measured the knockout cross sections of neutron-rich carbon isotopes at the intermediate- to high-energy region by using the External Target Facility (ETF) of the Cooler Storage Ring (CSR) at the Heavy Ion Research Facility in Lanzhou (HIRFL).



Isospin asymmetry dependence of the ratio of experimental to theoretical single-nucleon knockout cross sections. The hatched area denotes the systematics from experiments of intermediate energy (< 100MeV/u). Credit: Physical Review C

Knockout reactions induced by light nuclear targets have been demonstrated to be a powerful tool for probing the single-particle structure of rare isotopes away from the stability line. Spectroscopic factors for unstable isotopes have been studied by using knockout reactions at intermediate energies below 100 MeV/u. It is found that the measured spectroscopic factors for strongly-bound nucleon knockout are far less than thosecalculated by the reaction model.

The high energy of the beam is crucial for the applicability of the reaction model that uses the sudden and eikonal approximations. Therefore, it would be of important value to study these reactions at higher beam energies.

The radioactive ion beam line RIBLL2 at HIRFL-CSR is one of the few facilities around the world that can provide radioactive ion beams at intermediate- to high-energy (200-1000 MeV/u). In this work, neutron-rich 14-16C beams near ~240 MeV/u were produced by RIBLL2.

The researchers studied knockout reactions induced by these neutron-rich isotopes with the large-acceptance magnetic spectrometer ETF. The beam-energy dependence of the reduction on the extracted spectroscopic strength was also studied.

The one-nucleon knockout results indicate that the extracted spectroscopic factors do not have evident dependence on beam energy and imply that the deduced spectroscopic factors are robust to changes in beam energy at the intermediate energy region. This adds further confidence to the application of the eikonal model in knockout reactions at beam energies of near or above 100 MeV/u.

The result was published in *Physical Review C*.

More information: Y. Z. Sun et al, Single-neutron removal from C14,15,16 near 240 MeV/nucleon, *Physical Review C* (2021). DOI: 10.1103/PhysRevC.104.014310

https://phys.org/news/2021-09-results-knockout-reactions-hirfl-csr.html

thebmj

Tue, 07 Sept 2021

Covid-19: Infection increases the risk of kidney disease even in mild cases, finds study

People who have recovered from covid-19 have a greater risk of kidney disease, even if they only experienced mild to moderate covid-19 symptoms and were not admitted to hospital, shows a study published in the *Journal of the American Society of Nephrology*.[1]

Damage to organ systems such as the kidneys is a recognised complication of the post-acute phase for patients who were severely ill during the acute phase of covid-19, but the risks for patients who experienced milder covid-19 is less clear.

Researchers used data collected by the Veterans Health Administration in the US to compare the risks of kidney related conditions in 89 216 people who had recovered from covid-19 for at least 30 days against the risks in 1 637 467 who had not had covid-19.

Their analysis showed that people who had had covid-19 had a higher risk of acute kidney injury (adjusted hazard ratio (aHR)=1.94; 95% confidence interval 1.86 to 2.04) and major adverse kidney events (aHR 1.66; 95% CI 1.58 to 1.74). Major adverse kidney events were considered to be a decline in the estimated glomerular filtration rate (eGFR) of at least 50% since their first positive covid test, end stage kidney disease, or all cause mortality.

The risk of end stage kidney disease alone—that is, having a kidney transplant or receiving outpatient dialysis—was almost threefold higher for those who recovered from covid-19 (aHR 2.96; 95% CI 2.49-3.51). There were 4.65 cases of end stage kidney disease per 1000 person years among people who had had covid-19 compared with 1.43 cases per 1000 person years among the general population.

Declines in eGFR in those who recovered from covid-19 mirrored the severity of disease they had experienced. Compared with people who had not had covid-19, declines in eGFR ranged from -3.26 mL/min/1.73m2/year for those who had had the disease but not been admitted to hospital, to −5.20 mL/min/1.73m2/year for those who had spent time in hospital, and -7.69 mL/min/1.73m2/year for those who were admitted to intensive care.

Ziyad Al-Aly, director of the clinical epidemiology centre at the Veterans Affairs St Louis Health Care System in Missouri, who led the research said, “These results suggest that beyond the acute phase of covid-19 infection, people experience higher risk adverse kidney outcomes. Post-acute care of people with covid-19 should involve attention and care for acute and chronic kidney disease.”

While the findings suggest that acute kidney injury during the acute phase contribute to the increased risk of post-acute kidney outcomes, he added, “It is also evident that the risk was increased in those who did not have an acute kidney injury during the acute phase.”

BMJ 2021; 374 doi: https://doi.org/10.1136/bmj.n2189 (Published 06 September 2021) Cite this as: BMJ 2021;374:n2189

https://www.bmj.com/content/374/bmj.n2189