Chinese superconducting dipole magnet reaches 12 Tesla

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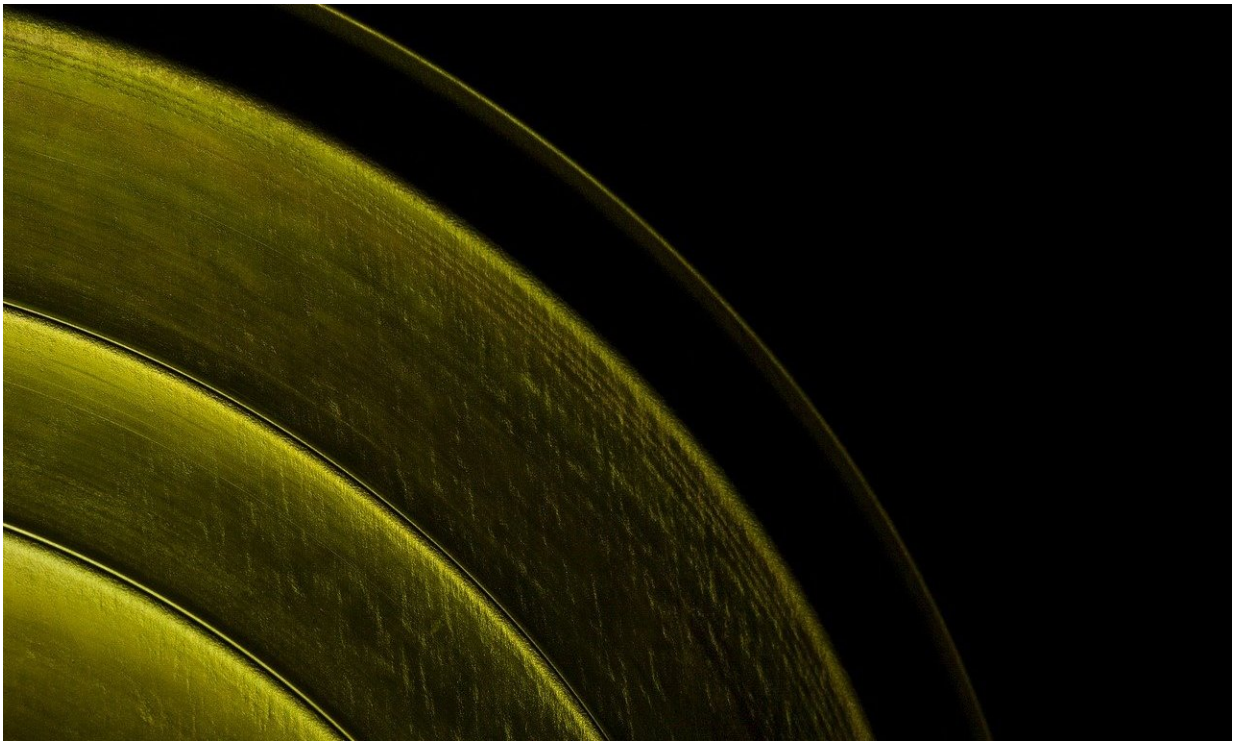

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The high-field superconducting magnet team of Institute of High Energy Physics (IHEP) of the Chinese Academy of Sciences has made progress in a new round of performance tests that ended on June 13. The magnetic field of the dipole magnet developed by the team exceeded 12 Tesla (Tesla) in two apertures at 4.2 K, reaching more than 85% of the

critical performance capacity of the superconducting wire. This magnet, including its design, superconducting materials, cables, coils, and related equipment and platform, is based on domestic technologies.

At present, the magnetic field record for a dipole magnet without aperture is 16 Tesla and is held by the European Organization for Nuclear Research (CERN). The record for a single-aperture dipole magnet is 14 Tesla and was just achieved by Fermilab in 2020. An achievement of 12 Tesla with twin aperture is at the forefront of the field. Furthermore, this magnet is currently the only one in the world that uses a combination of different superconducting materials to achieve a 12 Tesla dipole field strength. It is a milestone in the development of advanced high field accelerator magnets in China.

Experts including Lucio Rossi, former project leader of the CERN Large Hadron Collider High Luminosity Upgrade (HL-LHC) and currently the professor at the University of Milan, and other international colleagues, sent congratulatory letters to the IHEP team.

The strong magnetic field provided by the high-field superconducting magnet can control the trajectory and size off the high-energy charged particle beam, which is the core requirement of basic physics research, advanced nuclear fusion energy technology, high-energy particle accelerator construction, etc. High-field superconducting magnet technology has been listed as one of the top priority core technologies for the development of high-energy physics over the next ten years in Europe and the United States.

Provided by Chinese Academy of Sciences

https://phys.org/news/2021-06-domestic-superconducting-dipole-magnet-tesla.html