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First test results of a short period superconducting helical undulator

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Superconducting undulators provide a possible means of broadening the range of wavelengths that can be covered by an XFEL facility by generating larger magnetic fields at shorter periods than can be achieved using permanent magnet undulators.

As part of ongoing prototyping work at STFC to develop a superconducting helical undulator with 13 mm period and 5 mm magnetic gap, a test cryostat has been designed and built to investigate the performance of 325 mm long prototype magnets. The test cryostat is used to cool prototypes to 4.2 K and to power them to a full operational current of 250 A. Cryogenic Hall sensors measure the field in the magnet bore during testing. Techniques to measure the field profile and the integrated field components inside the small, closed magnet bore have also been developed. These measurements are crucial for understanding the magnetic performance of the prototype magnets and identifying and implementing suitable corrections to the field integrals. We present here the first cooling and magnetic field measurement results of the prototype undulators.

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

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