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A 15 T large aperture dipole for testing fusion and accelerator superconducting samples

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High field superconducting magnets are an essential technology enabling the development of magnetic confinement fusion and high energy hadron colliders. These two communities have joined efforts to design a facility for testing superconducting cables and small insert coils. We propose a large aperture Nb₃Sn dipole to replace the magnet assembly of EDIPO, which was irreversibly damaged in 2016, while the rest of the EDIPO infrastructure, including cryostat, cryoplant, power supplies, and high current transformer, remained intact. The goal of this new magnet is to generate a background field of 15 T over a $\pm 0.5\%$ homogeneous field length of 1000 mm. The aperture will enable the test of samples from the two test facilities existing worldwide for the test of high current superconducting cables in a background field above 10 T: SULTAN (94×144 mm aperture) and FRESCA2 (100-mm-diameter bore). The main features of the magnet design will be discussed along with the status and outlook of this collaborative effort between Fusion and High Energy Physics laboratories.

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