

Abstract Submitted
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Design of MgB₂ Superconducting coils for the Ignitor Experiment* G. GRASSO, R. PENCO, S. BERTA, Columbus (Genova, Italy), B. COPPI, MIT, G. GIUNCHI, (Milano, Italy) — A feasibility study for the adoption of MgB₂ superconducting cables for the largest (about 5 m in diameter) of the poloidal field coils of the Ignitor machine is being carried out. This initiative was prompted by the progress made in the fabrication of MgB₂ long cables, and related superconducting magnets of relatively large dimensions. These magnets will be cryocooled at the operating temperature of 10-15 K that is compatible with the He-gas cryogenic cooling system of Ignitor as well as with the projected superconducting current density of the MgB₂ material, at the magnetic field values ($\simeq 4 - 5$ T) in which these coils are designed to operate. The optimal cable configuration has been identified that can provide an efficient cooling of the MgB₂ conductors over times compatible with the machine duty cycles. MgB₂ superconductors hold the promise of becoming suitable for high field magnets by appropriate doping of the material and of replacing gradually the normal conducting coils adopted, by necessity, in high field experiments. Therefore, an appropriate R&D program on the development of improved MgB₂ material and related superconducting cabling options has been undertaken, involving different institutions.

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