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High Field Accelerator Magnets: a Path to New Physics

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The discovery of the Higgs boson at the Large Hadron Collider at CERN has brought High Energy Physics (HEP) in the spotlight. One of the aims of the next step in HEP is to find physics “Beyond the Standard Model” (BSM). This relies on the systematic analysis of the events generated, searching for the unexpected, as well as precision measurements, checking for anomalies. Though it is generally accepted that BSM physics must exist, it is not clear where and what BSM physics will be. Several paths are being traced for this search. One of them depends on brighter beam collisions, and larger, higher energy colliders. These are priorities identified in the 2013 European Strategy for Particle Physics, confirmed in the 2014 report of the US Particle Physics Project Prioritization Panel. A cornerstone of this search is high field accelerator magnet technology. This presentation focuses on the high-energy physics motivation for high field magnets, a short overview of the state-of-the-art of accelerator magnet technology beyond 10 T, the R&D targets for the next 10 years, and an overview of what are the main issues towards 20 T accelerator magnets.

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