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The FuSuMaTech initiative: Synergy with Industry and Impact on the Future Superconducting Magnet Technology

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The CERN's projects, HL-LHC and FCC, will create a big push in the state of the art of High-Field Superconducting magnets. The performance of superconducting materials such as Nb₃Sn and HTS will be developed to yield higher performance at lower costs and the construction materials and techniques will be advanced. In the context of Energy's savings, Industry is experiencing a renewed interest in the domain of industrial superconductivity with fault current limiters, wind generators and electric energy storage. Medical Research shows a strong interest in High-Field MRI, especially for the brain observation. Considering the social impact of the HL-LHC project and FCC study, CERN and CEA have established a Working Group on Future Superconducting Magnet Technology (FuSuMaTech). The working group has explored a large spectrum of possible synergies with Industry, and proposed a set of R&D&I projects to be conducted jointly between academics and industry. To keep the leading position of Europe, the most efficient way is to support common activities of industry and academic partners on the common concerns in view of overcoming the technological barriers. The FuSuMaTech initiative aims, to create the frame of collaborations and to provide common tools to all the European actors of the domain. The FuSuMaTech initiative is a dedicated and large scale silo breaking program which will create a sustainable European Cluster in applied Superconductivity. It will enlarge the innovative potential especially in High Field NMR and MRI, opening future breakthroughs in the brain observation. Based on practical case studies, the FuSuMaTech Phase 1 is the first step of the FuSuMaTech initiative. It will consist in preparing the detailed description of R&D&I actions, the administrative and legal conditions and the funding scheme for the future. This paper summarizes the initial R&D axis, and the roadmap foreseen to germinate the proposed collaborative developments.

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