Develop High-field Accelerator Magnet Technology Using REBCO CORC® Conductors

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***Abstract* — Future circular colliders require dipole magnets that can not only generate high magnetic fields but also be cost effective. Although REBCO coated conductors have the potential to meet both requirements, how to make high-field accelerator magnets using REBCO conductors remains a challenge. The U.S. Magnet Development Program (MDP), sponsored by Office of Science at the Department of Energy, is addressing this challenge by developing REBCO dipole magnets in collaboration with industry partners. Here, we present the REBCO CORC® magnet results from the MDP in the past few years. We discuss their implications, lessons learned and the next steps. Development of high-field accelerator magnets is pushing the performance, such as current density and mechanical flexibility, for REBCO tapes and multi-tape conductors. Besides enabling future circular particle colliders, the development can be relevant for other applications such as compact fusion magnets that can open an unprecedented market for REBCO conductors.**

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