

High Fields, High Stakes: REBCO Technology for High-Energy Physics

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In this contribution, we approach superconductivity from the perspective of a magnet engineer in the field of high-energy physics, where field strength, field quality, robustness, and cost are of the essence. For decades throughout the Nb-Ti era, the conductor was regarded as a tightly specified commodity. To a degree, this attitude prevails today for Nb₃Sn and MgB₂. Over recent years, however, fusion applications have catapulted the community into the era of REBCO technology. Due to their microscopic properties and manufacturing processes, commercially available tapes pose a host of new and highly relevant challenges to magnet engineering and accelerator design. Meeting these challenges has the potential to enable new applications well beyond accelerators, while rendering existing ones more sustainable and economical. In this early stage of REBCO technology, we discuss how managing screening currents, quench protection, and mechanical strain may accommodate today's tapes, and how advances in conductor technology can make a difference in the prospects for large-scale adoption.