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R&D for Accelerator Magnets with React & Wind High Temperature Superconductors*

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This paper will report the R&D work at Brookhaven National Laboratory (BNL) for accelerator magnets that use High Temperature Superconductors (HTS). HTS offers two major advantages: (a) it retains high current density at high fields and (b) the magnets based on it can be operated at elevated temperatures. This makes HTS magnets particularly suitable for applications where performance of a few magnets, rather than the cost of the conductor, determines the overall design and performance of the machine. The critical current density in HTS has now reached a level that one can consider using it in the next generation accelerator projects. BNL is pursuing HTS-based magnet R&D for possible applications in magnets for a Very Large Hadron Collider (VLHC), a muon collider, or an interaction region upgrade of the machines that are either existing or are underway. All designs are based on conductor-friendly racetrack coil geometry where React & Wind technology can be used. The paper will report the results to date and plans for the future. It will also discuss the issues and challenges that are unique to HTS magnets.

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