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RF Characterisation of HTS-CC Tapes as Alternative Coating for the FCC-hh Beam Screen

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We are investigating high-temperature superconducting coated conductors (HTS-CCs) as an optional coating material for the beam screen of the FCC-hh, in order to reduce the beam coupling impedance. We focus on the use of shielded Hakki-Coleman resonators to validate the rf performance stemming several key test requirements: design, temperature, magnetic field and power. In our past work, we have proved that in temperature and dc magnetic field conditions close to those in the FCC, HTS surface resistance is significantly lower than that of copper. In this work, we analyse the rf magnetic field amplitude at the HTS surface within the resonator and find that it is comparable to FCC-hh requirements. Furthermore, we have extended our experimental set-up to measure surface reactance. These data can be used to extract HTS penetration depths and depinning frequencies.

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