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Robust critical current density in applied magnetic fields in 5 μm thick, $\text{SmBa}_2\text{Cu}_3\text{O}_{7-\delta}$ based superconducting wires¹ A.O. IJADUOLA, University of North Georgia, Dahlonega GA 30597, F. LIST, Oak Ridge National Laboratory, Oak Ridge TN 37831, H.-S. KIM, S.-S. OH, Korea Electrotechnology Research Institute, Changwon Korea, A GOYAL, Oak Ridge National Laboratory, Oak Ridge TN 37831 — We report the magnetic field and temperature dependence of the critical current density $\{J_c(H)$ and $J_c(T)\}$ flowing in a 5 μm thick sample of $\text{SmBa}_2\text{Cu}_3\text{O}_{7-\delta}$ (SmBCO) film. The film is a coated conductor (CC) deposited on an IBAD-MgO textured metallic template. For a range of intermediate fields, we find $J_c \propto H^{-\alpha}$ with values of α between 0.44 and 0.49. These values are lower than those reported for other CC in the literature. The sample also has higher J_c values when compared with other wires with similar thicknesses. Such high- J_c wires should find applications in large-scale energy applications of high-temperature superconductors. The temperature dependence of J_c at self-field and different applied fields is also analyzed.

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