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Coil Configurations Study for Bi-2212 Subscale Magnets CHRISTOPHER ENGLISH, Lawrence Berkeley National Laboratory, SUPERCONDUCTING MAGNET GROUP TEAM — The Superconducting Magnet Group at Lawrence Berkeley National Laboratory is developing subscale superconducting magnets consisting of Bi-2212 (Bi_2-St_2-Ca-Cu_2O_x) racetrack coils as part of its subscale program. Several configurations are being considered: the stand-alone racetrack, subscale common coil, subscale dipole, and subscale hybrid dipole. In order to prepare for the assembly and testing of these magnets, a study has been carried out to determine the short sample current (I_{ss}) and the Lorentz forces for each configuration. OPERA 3D has been used to ascertain the load lines for each subscale magnet. The intersection of these load lines with the engineering critical current density versus magnetic field curve ($J_{EC}(B)$) for Bi-2212 round wire subsequently determined the I_{ss}. The results show little variation in the I_{ss} of each configuration due to the small slope of the $J_{CE}(B)$ in the field range of 5-10 T. The Lorentz forces, also determined with OPERA 3D, have been analyzed by defining the magnetic pressure on the coils. Results from this analysis show that a possible testing sequence for the subscale program could be the stand-alone racetrack, subscale common coil, subscale dipole, and finally the subscale hybrid dipole, in order of increasing magnetic pressure.

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