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Fabrication of racetrack-type double pancake HTS coil for K500 extraction beam line steering magnet and qualification at liquid nitrogen temperature

Content :

A High Temperature Superconductor (HTS) based cryo-refrigerator assisted steering magnet is under development at VECC for the extraction beam line of K500 cyclotron. The magnet designed is specified for ± 3 degree horizontal correction and ± 1.5 degree of vertical correction of the beam of maximum rigidity of 3.3 T-m. The magnet is composed of two sets of double pancake racetrack coil – one set for vertical field (By) and other for horizontal field inside the return iron yoke. Both sets of double pancake coils are fabricated in-house with BSCCO-2223 HTS tapes by wet winding technique using cryogenic grade epoxy. The critical characteristics of the coils are evaluated at liquid nitrogen temperature in terms of critical current and index parameters. The paper describes the winding details of double pancake coils and test results at liquid nitrogen temperature.

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