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Study on Design Parameter of HTS Motor Using 3D Analysis

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Abstracts

Electromagnetic design of HTS (High Temperature Superconducting) motor is important to achieve the power at a given load condition, and it is essential to the thermal design for HTS motor. To determine the result of thermal design, the magnetic field distribution has to be known exactly. Especially, I_c (critical current) of HTS field coil is determined by not only operating temperature but also the B (magnetic field amplitude applied perpendicular to the tape surface). In shape design of field coil for the HTS motor, a method to reduce the B and to determine operating current should be considered in order to optimal design. On the basis of the 3D (Three dimensional) analytical method, I_c of HTS field coil was calculated by using I_c - B curve. And the 3D analytical method is verified by the 3D FEA (Finite Element Analysis).