High Temperature Superconductor Machine Prototype

A versatile testing platform for a High Temperature Superconductor (HTS) machine has been constructed. The stationary HTS field winding can carry up to 10 coils and it is operated at a temperature of 77K. The rotating armature is at room temperature. Test results and performance for the HTS field winding comprising four coils wound with two types of HTS tapes are shown and discussed. The field winding produces up to 0.62T in the 10mm air gap which constitutes 78% of the armature design value. Recommendations for the field winding operation are proposed and verified, which resulted in an increase of available magneto-motive force of the field winding up to 25%.

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