

Mechanical Vibration Tests of a Real-scale REBCO Coil

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We have been developing REBCO (Rare-Earth Barium Copper Oxide) magnets with the purpose of reducing the operation cost of the superconducting magnets. Because of its higher critical temperature, liquid helium is unnecessary for the cooling down of REBCO coils. Moreover, the cryocoolers are downsized. That is also effective in the weight reduction of the magnet. However, in a case where they are used in the maglev, the on-board superconducting magnets are exposed to severe vibration due to the varying magnetic field. This paper describes mechanical vibration tests of the actual REBCO coil. The coil was vibrated at 10 G (98 m/s^2) under the excited condition. The heat load due to the vibration was less than 2 W, which has little effect on the cooling of the magnet. In addition, eddy current heating was evaluated with numerical electromagnetic analysis.