

Monitoring and Protection Method for a REBCO Magnet Designed for Electromagnetic Vibration Tests

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We have been developing REBCO (Rare-Earth Barium Copper Oxide) magnets for the maglev. REBCO is one of the high temperature superconducting materials and is suitable for the on-board magnets of the maglev because of its high current density under the condition of a high magnetic field. A real-scale REBCO coil has been fabricated and its basic performance has been confirmed. As the next research target, electromagnetic vibration tests of ground coils by means of the real-scale REBCO coil is planned. Since the electromagnetic vibration tests usually takes several weeks, a monitoring and protection system is necessary for the REBCO magnet. If a normal conduction transition is undetected, the REBCO coil will burn out due to the Joule heating in the normal conducting region. A high-sensitive coil voltage detection method can be an effective measure against the burn-out.