Development of a Real-scale REBCO Coil for the Demonstration of Magnetomotive Force of 700 kA

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REBCO (Rare-Earth Barium Copper Oxide) is one the of high temperature superconducting materials and enables us to raise the operating temperature of on-board superconducting magnets of the maglev. Because of high operating temperature, the magnet can be cooled without liquid helium, and the energy consumption of the magnet will decrease by nearly half. The basic technologies about the magnet fabrication with the REBCO coated conductor are still under development. Therefore, we have manufactured a real-scale REBCO coil aimed at its application to the maglev. The real-scale coil was excited at 35 K and demonstrated magnetomotive force of 700 kA, which is the same as that of the existing on-board magnet. This paper describes the fabrication process of the coil and also the detail of the excitation test.