

Performances of Trapped Magnetic Field in Superconducting Bulk Magnets Activated by Pulsed Field Magnetization

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Abstract - Melt-textured large grain high temperature superconducting materials have a characteristic feature so as to trap the magnetic fields applied from outside, and act as quasi permanent magnets yielding intense magnetic fields which reach the values of several T in the open space above the sample surface. The performances of the magnets have been precisely investigated when intense pulse magnetic fields generated by feeding the currents up to 9.12 kA to the pulse coil settled around a cylindrical bulk magnet. In the experiment a condenser bank with large capacitances of 40-120 mF has been adapted to apply the magnetic fields up to 8.44 T to the Gd-Ba-Cu-O-based bulk magnet with the size of 30 mm in diameter. The performance of the trapped field has reached 3.28 T on the sample surface. The magnetic fields successively invading into the sample in the process called IMRA method have been investigated with respect to the behaviors of the magnetic flux in the sample.

Index Terms - bulk superconductor, magnetic field generator, refrigerator, trapped field magnet,

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