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Pulsed field magnetization of GdBCO bulk using a ring-shaped soft-iron yoke

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We study to improve a trapped field of REBCO bulk excited by pulsed field magnetization (PFM). In PFM, there are some merits such as a magnetizing system is compact and inexpensive, and magnetizing time is short. It is very important to simplify a magnetizing process in order to accelerate a practical use of bulk magnet. Then, we focus on a soft-iron yoke which is used in order to expose the bulk to a large amount of magnetic flux for a long time. In our previous study, trapped field performance was investigated by varying a diameter of disk-shaped yoke. In this paper, we evaluate an influence of a shape of soft-iron yoke on magnetizing characteristic. A ring-shaped yoke with a 64 mm outer diameter, 20 mm inner diameter and 47 mm thick is newly fabricated. PFM experiment using a GdBCO bulk 60 mm in diameter and 20 mm thick is performed by varying an amplitude of applied field and temperature, and these results are compared with that of a disk-shaped yoke.

Keywords: GdBCO bulk, pulsed field magnetization, ring-shaped soft-iron yoke, trapped field