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## Measurement of persistent current Gd123 coil for superconducting joint fabricated by CJMB method

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Recently, we suggested a new bridge-type joint between two  $\text{REBa}_2\text{Cu}_3\text{O}_{7-\delta}$  (RE123, RE: Rare Earth such as Gd, Y) conductors using RE'123 (RE': Rare Earth for low melting point of RE123, such as Yb, Y) bulk by heat treatment with crystal growth at boundary of wire-bulk. We call this method as crystalline joint by melted bulk (CJMB). In the CJMB method, only the bulk is incongruent melting that the Gd123 layers in the coated conductors keep the solid phase during heat treatment. we have been reported a model experiment results for the joint boundary between the coated conductor and the Y123 bulk as first step, and it is obtained that the interface has a critical current of 10 A with a high mechanical strength, indicating the feasibility of the practical superconducting joint. For superconducting joint between wires, we developed an infrared heater to heat treat in a small area about 10 mm diameter.

In this study, we successfully developed superconducting joint between Gd123 coated conductors during short preparation time below one day with critical current above 10 A at liquid nitrogen (77 K), also persistent current coil is prepared and measured in liquid nitrogen. In result, the persistent current gently decays after about 50 hours, then, the resistance is  $8 \times 10^{-13} \Omega$ .

In MT25, we would like to talk about the fabrication method and experimental results for the persistent current coil and superconducting joint fabricated by CJMB method.

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