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Thu-Mo-Po4.09-02 [64]: Development and test results of a superconducting joint resistance evaluation system

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Superconducting joints are extremely important for the application of HTS magnets. Recently, various joint techniques have been proposed for connection between HTS conductors. However, suitable evaluation methods for joint resistance (R_j) have not been established. We have developed a joint resistance evaluation system [1]. The system consists of an HTS sample with a joint, a current injection coil, and a split-pair superconducting magnet. The HTS sample and the magnet are conductively cooled by cryocoolers. The sample is composed of a one- or several-turn closed-loop. R_j of the sample is evaluated by a decay of the induced current in an LR closed circuit. Using the system, the joint resistances ranging 10^{-14} - $10^{-7} \Omega$ were quantitatively evaluated as a function of current magnitude, temperature, magnetic field and its orientation. In this paper, we report the commissioning results of the system and some latest joint resistance evaluation results.

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[1] K. Kobayashi et al., Supercond. Sci. Technol. to be submitted.

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