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Investigation of Temporal Stability of a Persistent Current Mode Prototype MgB2 Coil

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A superconducting magnet commonly used in current MRI systems should be operated in the persistent current mode (PCM) to yield a high-resolution level that requires a magnetic field drift of less than 0.01 ppm/h. To acquire the required field homogeneity as a function of time, the availability and even reproducibility of a superconducting joint technique enabling the PCM of the magnet should be guaranteed quantitatively. Currently, a helium-free MgB2 MRI magnet is being developed by the collaboration between Kiswire Advanced Technology Co. Ltd. (KAT) and Korea University, which is supported by the Materials and Components Technology Development Program of the Korean Evaluation Institute of Industrial Technology (KEIT), Korea. In this study, we report our progress on the development of a PCM prototype coil fabricated using MgB2 wires manufactured by KAT. The temporal stability of the prototype MgB2 coil was evaluated through the field decay tests at 4.2 K.

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