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## **Tue-Mo-Or9-05: A Tabletop, Liquid Helium-Free, Persistent-Mode 1.5-T MgB<sub>2</sub> “Finger” MRI Magnet: Test of a Half-Scale MRI-Quality Magnet**

*Tuesday, 24 September 2019 12:15 (15 minutes)*

In this paper, we present construction and persistent-mode operation results of a half-scale 1.5-T/54-mm room-temperature bore MgB<sub>2</sub> MRI-quality magnet for the development of a tabletop “finger” MRI system. A half-scale magnet, composed of 5 coil sections and a persistent-current switch, was wound with a single ~590-m long unreacted/monofilament MgB<sub>2</sub> wire having a superconducting joint, and then heat-treated. We operated the magnet, immersed in liquid nitrogen and cryocooled, successfully, achieving a persistent-mode 1.5-T field at the target operating current of 112 A in the temperature range 10-15 K. We also evaluated a temporal stability and a before-shimmed bare field homogeneity of the magnet by using both a hall probe and an NMR probe. Our discussion includes the spatial field homogeneity difference between as-designed and as-built magnets in consideration of manufacturing tolerance.

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