

## A Small 1.5 T Persistent Current Operating Test Magnet Using MgB<sub>2</sub> Wire with High $j_c$ Joints

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**Abstract** - Persistent current (PC) operating magnet with bore diameter of about 32 mm was design and developed based on multi- and mono- filament MgB<sub>2</sub> wires. The magnet was in a multi- solenoid structure. One pilot coil was wound and joints were fabricated at both ends, connecting it to a superconducting switch for PC operation tests. The magnet was proposed to demonstrate the high field and high temperature applications at different temperatures. Numerical and experimental results showed a promising future of MgB<sub>2</sub> wires in low-cost magnetic resonance imaging (MRI) systems and high field scientific magnets.

**Index Terms** - joints; MgB<sub>2</sub>; magnet; PC operation.

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