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## Magnetic field distribution on a 400 MHz all-REBCO at 20mm DSV and multi-layered ferromagnetic shimming

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A ferromagnetic shimming has been applied to improve the field homogeneity of NMR magnets. The study deals with the results of evaluating the magnetic field distribution for a 400 MHz all-REBCO NMR magnet at the 20 mm DSV(diameter sphere volume) with mapping experiments. The mapping path consists of 128 positions that moving along the surface of the cylinder 24 mm in diameter and 30 mm in height. The initial field homogeneity before shimming was very uneven at about 240 ppm. To improve it below 5 ppm, a multi-layer ferromagnetic shim was installed using a double cylinder. The outer cylinder was equipped with two shim sets composed of thick ferromagnetic shims. From the third round, the inner cylinder was installed with a shim set consisting of a thin shim stock of less than 3 mil(0.0762 mm). After successfully improving the field homogeneity to within 5 ppm at 20 mm DSV, long term operations will be conducted to check performance and stability to measure the magnetic field distribution of all-REBCO NMR magnets.

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