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A Novel Holding Field Coil for the SNS nEDM Experiment ELISE MARTIN, CHRIS CRAWFORD, YUNCHANG SHIN, BRAD PLASTER, DANIEL WOODS, University of Kentucky, NEDM COLLABORATION — Magnetic shielding requirements demand rigid constraints on the holding field for neutrons entering the SNS nEDM cryostat. The field must be uniform in the neutron path but vanish in the measurement cell and mu-metal shielding. In addition, the coil can only be formed of nonmagnetic materials. A modified double cosine-theta coil has been designed to satisfy these conditions. This coil was designed using the desired B-fields as boundary conditions and solving Maxwell's equations directly to obtain the coil winding geometry. A prototype coil has been built and field-mapped. A comparison of calculated and measured fields of this prototype will be presented.

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