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High Field Pulsed Magnets for Neutron Scattering at the Spallation Neutron Source[1] G. E. GRANROTH, Neutron Data Analysis and Visualization Division, Oak Ridge National Laboratory, J. LEE, Quantum Condensed Matter Division, Oak Ridge National Laboratory, E. FOGH, N. B. CHRISTENSEN, Department of Physics, Technical University of Denmark, R. TOFT-PETERSEN, Helmholtz Zentrum Berlin, H. NOJIRI, Institute for Materials Research, Tohoku University — A High Field Pulsed Magnet (HFPM) setup, is in use at the Spallation Nuetron Source(SNS), Oak Ridge National Laboratory. With this device, we recently measured the high field magnetic spin structure of $LiNiPO_4$. The results of this study will be highlighted as an example of possible measurements that can be performed with this device. To further extend the HFPM capabilities at SNS, we have learned to design and wind these coils in house. This contribution will summarize the magnet coil design optimization procedure. Specifically by varying the geometry of the multi-layer coil, we arrive at a design that balances the maximum field strength, neutron scattering angle, and the field homogeneity for a specific set of parameters. We will show that a 6.3kJ capacitor bank, can provide a magnetic field as high as 30T for a maximum scattering angle around 40° with homogeneity of ±4% in a 2mm diameter spherical volume. We will also compare the calculations to measurements from a recently wound test coil.

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