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Design and Improvement of a Pulse Shaping Inductor for a Pulsed Power Supply

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Pulsed power supplies (PPS) deliver high currents in a short period of time. Designing a pulse shaping inductor (PSI) requires major effort because of the electromagnetic forces exerted on the windings due to high pulse currents. A pulse shaping foil inductor is simulated with the help of finite element software COMSOL Multiphysics. Two different mechanical structures are designed in order to increase the strength of the inductor. The PSIs are manufactured and tested as a component of a 200 kJ PPS module. Test results show that the final PSI prototype can operate without any significant damage when the PSI current reach to 160 kA. Improvement process still continues to make the PSI more enduring.

Keywords: Pulsed Power Supply; Pulse Shaping Inductor; Foil Inductor; Finite Element Method

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