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Generation of magnetic fields at the 1MA pulsed power machine¹

V. V. IVANOV, University of Nevada, Reno, A. V. MAXIMOV, University of Rochester, J. D. MOODY, Lawrence Livermore National Laboratory, K. J. SWANSON, A. L. ASTANOVITSKIY, N. A. HUERTA, University of Nevada, Reno — Generation of the magnetic field by different loads at the Zebra pulsed power machine was studied. The longitudinal B-field of 1.7 MG in the half-turn coils and transverse field of 4 MG on the rod loads were generated using a load current multiplier with current of 1.3 MA. The magnetic fields were measured with the back-reflected Faraday rotation diagnostics. A cutoff of the Faraday signal in spiral loads was studied. Inter-coil discharge in the spiral loads produced x-ray/UV burst and induced opacity in glass samples located 3-12 mm from the load. Opacity blocked the Faraday laser signal and magnetic fields. Half-turn Cu and Ta coils and rod loads did not impact closely located targets. Using half-turn coils, penetration of the 1 MG magnetic field in the stainless steel tubes is demonstrated. Experiments with plasma in the axial and transverse magnetic fields are presented.

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