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Toward Advanced Modeling of Transport in Magnetized Inertial Confinement Fusion Targets[1] AYDEN KISH, ADAM SEFKOW, Laboratory for Laser Energetics, U. of Rochester — The effects of externally applied magnetic fields on the performance of fusion targets has been an open topic of research since the inception of inertial confinement fusion (ICF) and is still a topic in which our understanding can be greatly improved. Previous work has suggested that for high-gain 1-D targets, improved burn characteristics from magnetization are offset by the impediment of burn-wave propagation for little net improvement. Similar studies have shown that the application of axially aligned fields to cylindrical targets may lower the required areal density for ignition, but detailed analysis of burn-wave propagation in magnetized cylindrical targets has not been performed, aside from a cursory look using fluid models relying on Braginskii transport coefficients. Over the course of the past summer, using the results of a paper by Velikovich [1] et al. as a foundation, work has been done to explore simulation of magnetized cylindrical ICF systems with 1-D magnetohydrodynamics, and using the results of a study by Basko [2] et al. with 2-D particle-in-cell methods. Following this, initial work had been done on the development of a magnetized smoothed particle hydrodynamics model of similar systems. [1] A. L. Velikovich, J. L. Giuliani, and S. T. Zalesak, AIP Conf. Proc. 1639, 59 (2014). [2] M. M. Basko, A. J. Kemp, and J. Meyer-ter-Vehn, Nucl. Fusion 40, 59 (2000).

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Ayden Kish
Laboratory for Laser Energetics, U. of Rochester

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