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**Diagnosing Cryogenic DT Implosions at OMEGA and the NIF using Magnetic Recoil Spectrometry (MRS)** D.T. CASEY, J.A. FRENJE, C.K. LI, J.R. RYGG, F.H. SÉGUIN, R.D. PETRASSO, MIT, V.YU. GLEBOV, B. OWENS, D.D. MEYERHOFER, T.C. SANGSTER, UR-LLE, P. SONG, S. HAAN, S. HATCHETT, R. LERCHE, M. MORAN, O.L. LANDEN, LLNL, D.C. WILSON, LANL, R. LEEPER, R. OLSON, SNL — Spectral measurements of deuterons and tritons elastically scattered ("knock-ons") by DT primary neutrons have been used at OMEGA to determine the $\rho R$ of several types of implosions. But these techniques will fail for $\rho R$s larger than $\sim$200 mg/cm$^2$, which is expected in the OMEGA cryogenic DT campaign and at the NIF. We are therefore building a Magnetic Recoil Spectrometer (MRS), at both OMEGA and the NIF, to probe these large $\rho R$ implosions using the down-scattered neutrons that originate from the same scattering process. In this presentation, the similarities of the two neutron spectrometers, as well as some important differences, will be discussed. The OMEGA MRS will be interfaced and qualified early in 2007, which will be invaluable for the risk reduction of the NIF MRS. This work is supported in part by LLE, LLNL, the U.S. DoE, and the N.Y. State Energy Research and Development Authority.

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