Abstract Submitted
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**Mesurement of thermal transport and plasma evolution by Thomson scattering** COLIN BRUULSEMA, University of Alberta, WILL FARMER, MARK SHERLOCK, GEORGE SWADLING, MORDY ROSEN, STEPHEN ROSS, LLNL, WOJCIECH ROZMUS, University of Alberta — A series of recent experiments [1] on the Omega laser facility with spherical beryllium and gold targets employed Thomson scattering (TS) to measure the time evolution of plasma parameters at several locations in the underdense corona. Measurements were used to validate the thermal transport description in the large scale radiation hydrodynamic code that models inertial-fusion targets. Details of the TS theory and experimental implementation are discussed in this talk. These include plasma inhomogeneity, heating by the probe, optics effects and wave front tilt. Two directions of wave vectors, both radial and tangential to the target surface directions are measured and analyzed. Similarly to the recent study [2] thermal transport is investigated by careful matching of the TS spectra using particle distribution functions calculated in Vlasov-Fokker-Planck (VFP) code and derived in the classical and nonlocal models. Scattering on ion-acoustic fluctuations and asymmetry of the resonant peaks is used to measure return current corresponding to the heat flux. The blue shifted peak in the electron plasma fluctuation spectra constrains high velocity part of the electron distribution functions. We examine applicability of the Schurtz-Nicolai-Busquet transport model [3] in these plasmas. [1] W.A. Farmer, C. Bruulsema, G. Swadling *et al.* Phys. Plasmas, *submitted* (2020). [2] R.J. Henchen, M. Sherlock, W. Rozmus *et al.* Phys. Rev. Lett. **121**, 125001 (2018). [3] G.P. Schurtz, P.D. Nicolai, and M. Busquet, Phys. Plasmas **7**, 4238 (2000).

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