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Ion acoustic turbulence and anomalous laser absorption due to temperature gradient in ICF plasmas PAUL-EDOUARD MASSON-LABORDE, CEA, DAM, DIF, WOJCIECH ROZMUS, University of Alberta, Edmonton, AB, Canada, SYLVIE DEPIERREUX, CEA, DAM, DIF, MARK SHERLOCK, LLNL, CA, USA, VERONIQUE TASSIN, CEA, DAM, DIF, VALERY BYCHENKOV, P.N. Lebedev Physics Institute, RAS, Moscow, Russia — Hot plasmas with strong temperature gradients, as the one obtained in inertial confinement fusion (ICF) experiments, may present electron heat flux able to generate ion acoustic instabilities. Return current instability (RCI) due to electron heat flux could be the source of stationary ion acoustic turbulence (IAT). Therefore, anomalous laser light absorption due to enhanced anomalous collisionality could occur in plasma where Landau damping of ion is negligible. Such effects are expected to occur inside hohlraum in gold plasma where ZTe/Ti¿¿1. Anomalous absorption and electron heat flux limitation due to RCI has been included as a reduced model in hydro code. Analysis of RCI in gold hohlraums experiments is presented. A specific experiment has been done on the Omega laser facility to measure and identify this instability. For this experiment, a gold plate heated by many beams generates expanding plasma, on which a probe beam is send to measure its absorption. At the same time, Thomson scattering is done along the path of the probe beam to measure plasma conditions and to measure ion acoustic wave (IAW) of the ion acoustic turbulence. Implications of all these processes for laser plasma interaction experiments are described and discussed.

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