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Hydrodynamic modeling of gold bubble expansion in gas-filled hohlraums PAUL-EDOUARD MASSON-LABORDE, CEA DAM DIF, WOJCIECH ROZMUS, Theoretical Physics Institute, Department of Physics, University of Alberta, Edmonton, Alberta, Canada , PASCAL LOISEAU, CHRISTOPHE ROUSSEAUX, MICHEL CASANOVA, DENIS TEYCHENNE, GAEL HUSER, M-C MONTEIL, CEA DAM DIF — Experimental campaigns have been conducted using gas-filled hohlraums on the LIL facility, which was a prototype of one quadruplet of the french laser megajoule (LMJ), to study the gold bubble expansion seen by the outer beams in ignition hohlraum. This setup, with 6ns laser pulse duration and a maximum energy of 15kJ, allowed us to study the gold bubble expansion that occurs in ignition hohlraum and to test our hydro-radiative simulations by variations in thermal conduction and atomic physics models. In this talk we will present and discuss hydrodynamic calculations together with experimental results of the campaign. Under this configuration, with the temperature gradient obtained in the simulation, we will examine and discuss the possibility of an anomalous process involving ion-acoustic turbulence excited by the heat-flux driven return current instability. This process could lead to an increased laser light absorption in gold as well as thermal transport inhibition. Comparisons between experimental measurements and simulations will be discussed to support our interpretation.

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