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Plasma interpenetration study on the Omega laser facility SEBASTIEN LE PAPE, LAURENT DIVOL, STEVEN ROSS, SCOTT WILKS, PETER AMENDT, LAURA BERZAK HOPKINS, llnl, GAEL HUSER, cea, JOHN MOODY, llnl, ANDY MACKINNON, slac, NATHAN MEEZAN, llnl — The Near Vacuum Campaign on the National Ignition Facility has sparked an interest on the nature of the gold/carbon interface at high velocity, high electron temperature, low-electron density. Indeed radiation-hydrodynamic simulations have been unable to accurately reproduce the experimental shape of the hot spot resulting from implosion driven in Near Vacuum Holhraum. The experimental data are suggesting that the inner beams are freely propagating to the waist of the hohlraum when simulations predict that a density ridge at the gold/carbon interface blocks the inner beams. The discrepancy between experimental data and simulation might be explained by the fluid description of the plasma interface in a rad-hydro code which is probably not valid in when two plasma at high velocity, high temperature are meeting. To test our assumption, we went to the Omega laser facility to study gold/carbon interface in the relevant regime. Time resolved images of the self-emission as well as Thomson scattering data will be presented. For the first time, a transition from a multifluid to a single fluid is observed as plasmas are interacting. This work was performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under contract DE-AC52-07NA27344.

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