New radiographic image processing tested on the simple and double-flux platform at OMEGA

Olivier POUJADE [1]
1) *CEA, DAM, DIF, F-91297 Arpajon, France*
E-mail: olivier.poujade@cea.fr

Ablation fronts and shocks are two radiative/hydrodynamic features ubiquitous in inertial confinement fusion (ICF). A specially designed shock-tube experiment was tested on the OMEGA laser facility to observe these two features evolve at once and to assess thermodynamical and radiative properties. It is a basic science experiment aimed at improving our understanding of shocked and ablated matter which is critical to ICF design. At all time, these two moving ``interfaces" separate the tube into three distinct zones where matter is either ablated, shocked or unshocked. The {\it simple-flux} or {\it double-flux} experiments, respectively one or two halfraum-plus-tube, have been thought up to observe and image these zones (with XRFC and SOP). The possibility of observing all three regions at once was instrumental in our radiographic image processing used to remove the backlighter background otherwise detrimental to quantitative measurement. By so doing, after processing the radiographic images of the 15 shots accumulated during the 2013 and 2015 campaigns, a quantitative comparison between experiments and our radiative hydrocode simulations was made possible and happened to be quite successful in the shocked and unshocked region. Few points of the principal Hugoniot of the aerogel used as a light material in the shock-tube were inferred from that comparison and, most surprisingly, during the backlighter pulse, a rapid variation of x-ray transmission in the ablated zone (seen from the XRFC) was observed.