

"DEBUSSY" ORION CAMPAIGN: OBSERVATIONS AND NUMERICAL SIMULATIONS OF TARGET SHRAPNELS ORIGINATING FROM LASER EXPERIMENTS

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During plasma experiments on high energy laser facilities, debris and fragments originating from the target can result in significant damage to optics and/or equipment. In this context, a predictive tool is being developed by CEA for assessing the risk of damage due to the speed, mass, state and direction of ejected material.

A dedicated campaign was performed in June 2014 on the Orion facility, in collaboration with AWE, to collect data for the validation of the models used to predict fragment generation. The first part of the campaign was related to the characterization of debris and shrapnel emitted from halfraums and cylinders using particle Doppler velocimetry (PDV) and passive collectors (aluminium and polyethylene sleeves surrounding the target, varagel and aerogel collectors). The second part aimed at collecting velocimetry data on spallation of samples (steel, Ta, Ti, Al, PMMA, SiO₂) under x-rays loading.

Recent processed PDV signals and data extracted from the collectors characterization (micro-tomography and optical characterization of impacts) will be presented and compared to simulations.