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PDV experiments on size-calibrated particles accelerated using a pulsed laser PATRICK MERCIER, GABRIEL PRUDHOMME, CEA,DAM,DIF, LAURENT BERTHE, PIMM, UMR 8006 CNRS-Arts et Métiers ParisTech, 151 bd de l'Hôpital, F-75013 Paris, JACKY BENIER, PIERRE-ANTOINE FRUGIER, CEA,DAM,DIF — In order to observe a particle cloud produced at the output face of a shock-loaded plate, we performed several experiments with size-calibrated particles deposited on an Aluminum plate. It was shock-loaded using a pulsed laser (1 J, 10 ns, 532 nm) resulting in an acceleration of the particles up to 100 m/s. Various experiments have been performed to study the influence of different parameters: the particle material (Cu, Al, Au), the particle diameter (a few micrometers), the thickness of the deposited particle layer and the shock pressure. We recorded the back-reflected light with both orthogonal and tilted probes, and we present the corresponding PDV spectrograms displaying cloud velocities as well as velocity tracks due to individual particles. Some of them decelerate within the ambient gas while others, non-spherical, also rotate. By applying a deceleration model, we were able to determine the initial particle velocities and their sizes. The obtained sizes are consistent with the manufacturer values. In addition, the tilted probes could be used to infer information on the shape of the moving particle clouds.

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