

Abstract Submitted
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Cluster mass fraction and size distribution determined by fs-time-resolved measurements XIAOHUI GAO, XIAOMING WANG, BONGGU SHIM, ALEXEY AREFIEV, MIKHAIL TUSHENTSOV, BORIS BREIZMAN, MIKE DOWNER, University of Texas at Austin — Characterization of supersonic gas jets is important for accurate interpretation and control of laser-cluster experiments. While average size and total atomic density can be found by standard Rayleigh scatter and interferometry, cluster mass fraction and size distribution are usually difficult to measure. Here we determine the cluster fraction and the size distribution with fs-time-resolved refractive index and absorption measurements in cluster gas jets after ionization and heating by an intense pump pulse. The fs-time-resolved refractive index measured with frequency domain interferometer (FDI) shows different contributions from monomer plasma and cluster plasma in the time domain, enabling us to determine the cluster fraction. The fs-time-resolved absorption measured by a delayed probe shows the contribution from clusters of various sizes, allowing us to find the size distribution.

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