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Plasma Dynamics of 1 kHz Repetitive Laser Ion Source

A laser ion source, one of the high-current ion sources, uses ablation plasma generated by irradiating a solid target with a pulsed laser. To use industrial applications with the laser ion source, a large number of ions should be provided. Since recent pulse laser systems have high repetition rates above 1 kHz, we study the effect of plasma dynamics on the repeating plasma generation. A target sample as copper or aluminum was irradiated by a pulse laser (AO-16). The parameters of the pulse laser are 100 mJ of energy and 1 kHz repetition. The generated plasma was observed by a time-of-flight method using a Faraday cup. To measure the ablation mass of the sample, we use the pressure sensor behind the sample. In this presentation, we will discuss the plasma dynamics during repetitive plasma generation.

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