

# Development of a high repetition rate target system for laser-plasma acceleration

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## Abstract

For laser-plasma based accelerators to replace conventional radiofrequency accelerators as a source of particles, some characteristics as luminosity or flux have to be improved. In order to increase the flux of accelerated particles from solid targets it is necessary to implement a multi shot target system.

However, high repetition rate solid targets feature their own difficulties that become more challenging as the working frequency increases. Here we present a system based on thin layers of Aluminum grown on silicon wafers that is able to house more than 7k individual targets, or more than 10 minutes of operation time at 10 Hz repetition rate.

The position of the target system with respect to the focal spot of the laser beam is measured in real time and allows the modification of the position of the target in each shot. In his work, the accuracy of positioning, degrees of freedom, tolerances, etc. are discussed.