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A Gatling-Gun Target Delivery System for High-Intensity Laser Irradiation Experiments

Thursday, 19 September 2019 18:40 (20 minutes)

Intense laser irradiation experiments of sub-micrometer scale targets are currently performed at slow shot rates. This limitation is the result of the inability to place such targets quickly and accurately in the focus of the laser. I will present a target setup that enables irradiation at a high rate and sub-wavelength positioning accuracy. Three hundred targets were micro machined and mounted on a single Si wafer. The system implements a closed feedback loop between a triangulation displacement sensor and a motorized manipulator. Using this setup, we demonstrate repeatable stable proton acceleration from 600 nm thick Au foils at a rate of 0.2 Hz. This system
will enable studies that require a large overall dose, high statistical significance, or a fine scan of
target geometric attributes. Gershuni, D, et. al, A gatling-gun target delivery system for high-intensity laser irradiation
experiments, Nucl. Instruments Methods Phys. Res. Sect. A Accel. Spectrometers, Detect. Assoc. Equip. 934 (2019) 58–62. doi:10.1016/J.NIMA.2019.04.071.

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