ID contributo: **245** Tipo: **Poster (student)**

Characterization of Liquid Micro-Droplets for Laser-Driven Proton Acceleration

martedì 19 settembre 2023 19:00 (1O 30m)

In laser-driven particle acceleration the choice of the target material can have a large impact on the acceleration process. Therefore, a laser-driven proton acceleration experiment was conducted at the POLARIS laser system, where liquid micro-droplets made of water or ethylene glycole were used as targets.
Droplet chains were created by a pressurized capillary nozzle, which was made to vibrate with an oscillating piezo element. The driving frequency was synchronized to the laser pulses to create stable droplets for each laser shot. The stability of the droplets was examined for different pressures, driving frequencies and liquid types.
The droplets were then irradiated by laser pulses from the POLARIS laser system, which had intensites up to $4 \cdot 10^{19}$ W/cm^2 and accelerated protons via the TNSA-mechanism. The shape of the resulting proton beam was observed with a Thomson-Parabola.
In the experiments, the proton beam profile showed modulations in the beam density, which could be strongly reduced, when ethylene glycole was used. A possible explanation for these modulations could be electric fields, which are created in the background gas. Since ethylene glycole has a much lower vapor pressure, the modulations are less severe.

Autore principale: NOLTE, Mathis (Friedrich-Schiller Universität)

Relatore: NOLTE, Mathis (Friedrich-Schiller Universität)

Classifica Sessioni: Poster session

Classificazione della track: WG6: Ion acceleration and developments towards fusion