Contribution ID: **3320** Type: **not specified**

# P2.2008 Density enhancement of microprojectiles and plasma streams produced at laser acceleration experiments

*Tuesday, 9 July 2019 14:00 (2 hours)*

See the full abstract here:
http://ocs.ciemat.es/EPS2019ABS/pdf/P2.2008.pdf

Investigations using the so-called Cavity Pressure Acceleration (CPA) method were carried out on the Prague Asterix Laser System (PALS). The main goal of this research was to test and analyze a possibility of increasing density of plasma objects accelerated by laser light in channel cavity targets. The microprojectiles/plasma streams leaving the open channel rapidly lose density expanding in the hemisphere. In the case of a covered channel, the expansion is much slower. A thin foil covering the target causes local compression of the bursting plasma. A significant part of the energy of expanding plasma is transferred to the thin covering foil (with a solid density) which means higher density and higher energy density of the accelerated plasma object. Experimental measurements were made for cavity targets with 12 micron and 6 micron polystyrene foils. The foils covering the target channel were 1 or 2 micron thick. Iodine laser ( lambda= 1.315 micron) energy was several hundred (up to 600) joules. In addition, numerical calculations were also performed, using a hydrodynamic code that takes into account significant physical processes influencing the acceleration process in order to check and compare experimental results. The main conclusion is that the proposed method allows an evident increase of density of the accelerated plasma objects (up to one-two orders) without significant drop in velocity.

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**Session Classification:** Poster P2

**Track Classification:** BPIF