Contribution ID: **33** Type: **Poster**

Nanoparticle-assisted laser wakefield acceleration and the influence of nanoparticle material on accelerated electrons

Laser-driven plasma-wakefield acceleration has the potential to reduce the size and construction cost of large-scale accelerator facilities, by providing accelerating fields up to three orders of magnitude greater than that of conventional accelerators. However, the parameters of the electron beam and its stability need to be further improved to enable efficient use in many interesting industrial and medical applications as well as in various areas of fundamental research.

Since electron injection is one of the key features determining the beam characteristics, various injection mechanisms yielding better electron beam parameters were proposed over the last several years. The most recent and very promising scheme is a gas target containing nanoparticles which, according to simulations, seems very promising, especially in experiments trying to reach multi-GeV electrons. The improvement in terms of the stability of the electron beam have alredy been proven in experiments.

This poster presents a study focused on the influence of various nanoparticle materials, on the injection process and accelerated electron beam. The study was performed using large-scale particle-in-cell simulations which were carried out with PIC code Smilei.

Primary author: ŠPÁDOVÁ, Alžběta (ELI Beamlines Facility, Czech Technical University in Prague)

Co-authors: GRITTANI, Gabriele Maria (ELI Beamlines Facility); VALENTA, Petr (ELI Beamlines Facility); LORENZ, Sebastian (ELI Beamlines Facility); BULANOV, Sergei (ELI Beamlines Facility)

Presenter: ŠPÁDOVÁ, Alžběta (ELI Beamlines Facility, Czech Technical University in Prague)

Session Classification: Poster Session & Industry Display