

## **PIC Simulation of laser irradiated Micro-Plasma with varying density**

*Friday, 31 January 2020 11:25 (25 minutes)*

We report on a 3D simulation study of relativistic short laser pulses ( $10 < a_0 < 120$ , 20-150 fs FWHM) interacting with isolated targets of micrometer size.

Topic of the study is the emission of fast protons from targets representing hydrogen gas clusters or plastic spheres. Different densities from undercritical to solid conditions, show distinct acceleration mechanisms. We consider the difference between mono-species and two-species plasmas as well as linear and circular polarisation.

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**Session Classification:** Special Session on PIC Simulations II