

The first results from the x-ray emission measurements at Draco PW laser facility

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Laser-produced plasmas are widely studied complex systems. In order to get better understanding of their inner processes, advanced diagnostics methods have to be used to get a valuable insight – for example, x-ray emission spectroscopy has the capability to unfold atomic processes and plasma conditions and reveal information about the hot electron population.

Recently, two x-ray crystal spectrometers were installed in the Ion Acceleration Lab at Draco PW laser facility, which allows to acquire characteristic emission spectra including Ti K- α and He- α lines from Ti targets. While quartz spectrometer offers wide spectral range and excellent spectral resolution of ~ 0.3 eV, Ge spectrometer focuses on Ti K- α emission lines and provides 1D spatial imaging with resolution below 10 μm .

Here, we present the first results from the x-ray spectroscopic measurements from proton acceleration targets at the DRACO PW laser facility uncovering the plasma conditions and electron dynamics for various target and laser configurations including inclusion artificial pre-pulse or the use of reduced mass targets.