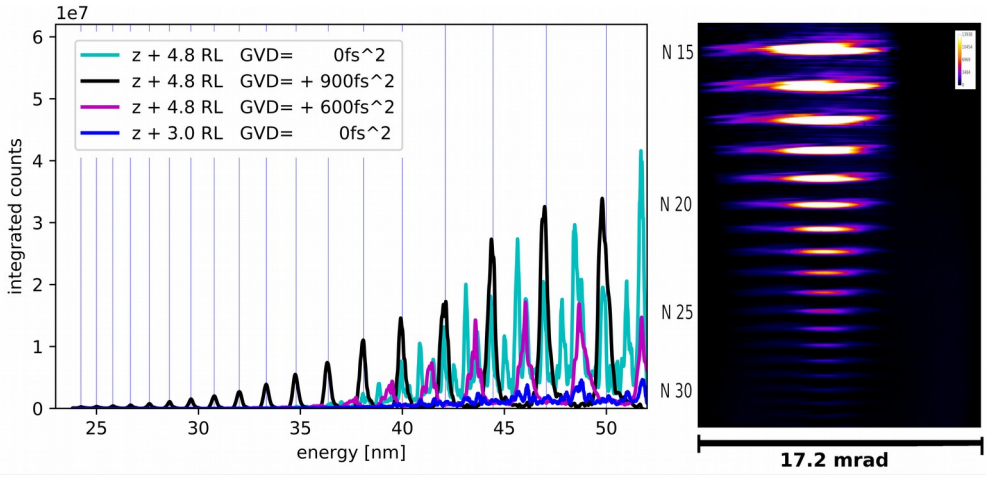
Open PhD student Position

Atto second pulse trains – coherent brilliant XUV pulses – High Harmonic Generation – relativistic laser intensities

SURFACE HIGH HARMONIC GENERATION VIA RELATIVISTIC LASER PLASMA INTERACTION

A relativistic laser Intensity is reached at I = $1x10^{18}$ W/cm^2 . When a laser pulse at this high intensity interacts with a solid target in the first laser cycles a plasma at the target boundary is created. The peak intensity of the laser interacts with this dense plasma and drives its electrons to collective relativistic oscillations. The laser pulse is partially reflected from this oscillating plasma surface and according to Einsteins Relativistic Mirror Model undergoes a relativistic frequency upshift. The dopplershift and an emission once per lasercycle manifests in the spectrum as high harmonics of the fundamental laser frequency and is in the time-picture an as pulse train – ROM harmonic generation.

The announced PhD Thesis will investigate SHHG with novel experimental approaches at extreme parametric conditions (density, intensity, relativistic, plasma…) with using the Jeti200 laser system (200 TerraWatt, 20 femtoseconds, 7J) in Jena, Germany. The PhD thesis will focus on the basic research on SHHG and how the efficiency of these novel as light source can be incrased, the process stabilized and characterised.
The work includes nonlinear ultra fast optics, state of the art laser physics, laser plasma physics, design and plan experiment, lab work, engineering, programming, spectroscopic methods, auto corellation methods … and some more.



We are looking for a PhD student with having a passion for experimental physics, optics, nonlinear optics, relativistic physics, who loves “hands on” physics and who is interested in learning about and working with the state of the art of ultrashort and ultra high intense laser pulse technology*.

Experimental PhD Thesis will be funded by the HI Jena, 50% TVOD 13
Supervisor: Professor Matt Zepf

For further information please contact j.braenzel@gsi.de, we are happy to answer any of your questions. Applications should contain CV, Master degree

certificate and if available a recommendation letter and can be send to the same mail address.

* imagine our mirror sizes are already of about 30cm in diameter !!! :)