

FERMI: EUV and Soft X-Ray FELs with HGHG

Enrico Allaria, Elettra-Sincrotrone Trieste S.C.p.A.

FERMI@Elettra is an FEL user facility covering the EUV - soft X-Ray spectral range (80 to 4 nm). The wide spectral range is covered by means of two distinct FEL lines using the same electron beam accelerator. The longer wavelength spectral range (80-20 nm) is generated by FEL-1 that is based on a single stage high gain harmonic generation (HG) seeded by an UV laser. FEL-1 commissioning started in December 2010 and in December 2012 first user operations have been planned.

The shortest wavelength range (20-4nm) is achieved by FEL-2 that is based on a double stage high gain harmonic generation seeded by an UV laser. FEL-2 commissioning started in 2012 and it allowed for the first time to demonstrate that the HG harmonic cascade with the fresh bunch technique can be efficiently used to seed a soft x-ray FEL starting from a UV laser.