

Solstice[®] Ace[™] - XUUS[™]-5 - Arterium[™] Imaging Spectrometer Beamline Test Results



Key Results

- EUV photon energy in the range of **30-120eV** pumped with 785nm wavelength.
- Bright harmonics with narrow linewidths pumped at a fixed **1kHz** repetition rate at a customer laboratory. Up to 10kHz repetition rate can also be pre-selected.
- High flux EUV photon generation observed using a minimum pump pulse energies of **0.5mJ with Argon** and of **2mJ with Helium**.
- High EUV photon flux at source is measured and calibrated, reaching up to **8.0x 10¹¹ photons/sec full spectrum** and **1.7x 10¹¹ photons/sec per harmonic** at the **27th harmonic (43eV** in photon energy).
- Driven with **<40fs** pulses, the EUV pulses are suitable for a wide range of applications, including but not limited to, spin dynamics, attosecond nonlinear physics, trARPES, and more.
- The XUUS-5 and Arterium beamline installation were done within days and all the HHG performance measurements were done in-situ. The integration process is quick and easy.
- The resulting source configuration is **simple, versatile, commercially available** and **readily-accessible** to customers who have an equivalent Ti:sapphire pump source.

HHG Performance

	Ar	He
Rep Rate (kHz)	1	1
Pulse Energy (mJ)	1.0	4.0
Harmonic of 785nm	27	61
Photon Energy (ev)	43	96
Flux At Source (phot/sec)	8.0x 10 ¹¹	2.4x 10 ¹⁰

Representative flux measurements with Si diodes for all harmonics and calculated to source based on 50% rejector reflectivity for 30nm and 80% for 13nm, and 2-3% filter transmission. Single harmonics range from 10-40% of total flux.

HHG spectra

