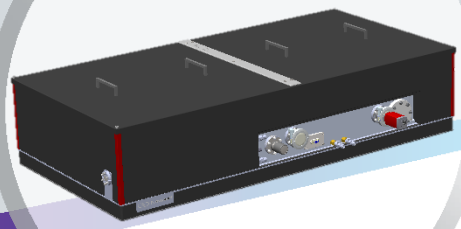
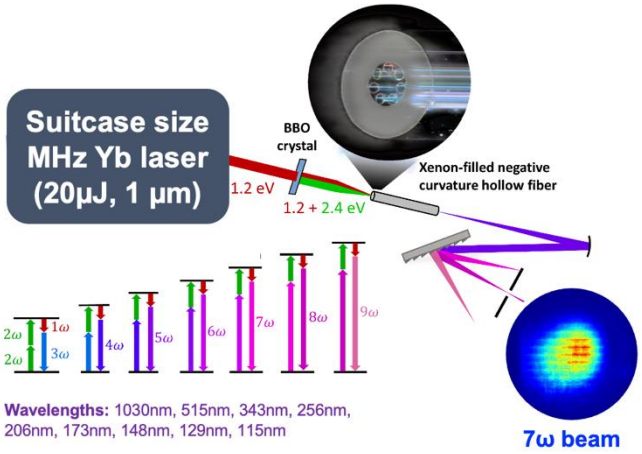
Hyperion VUV

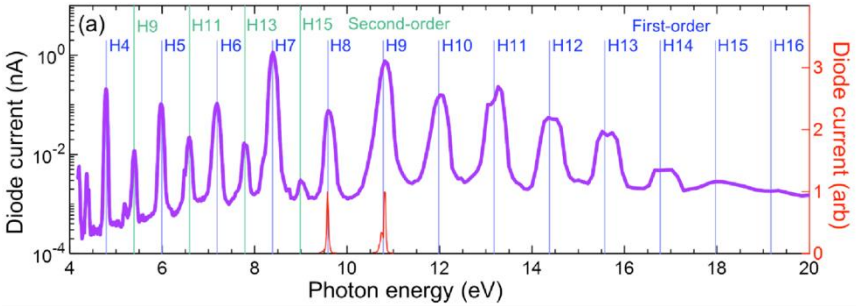


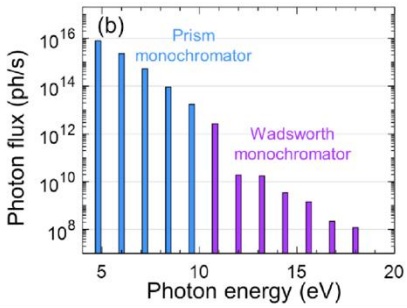
KMLabs' **Hyperion VUV**™

-The first discretely-tunable tabletop VUV laser source allowing for unprecedented flux and flexibility

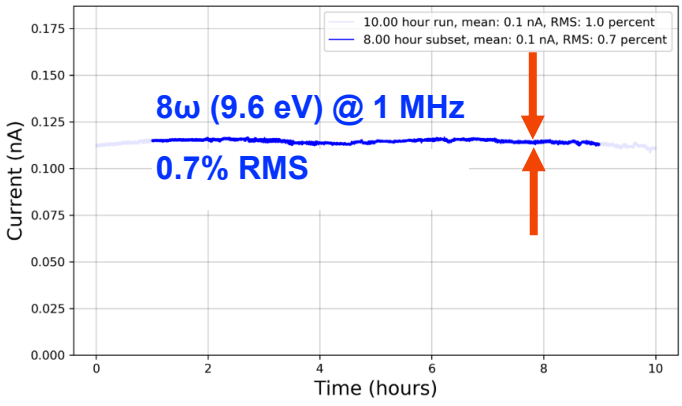


Hyperion VUV Source with Monochromator





Specifications	
Photon Energy (eV)	User selectable: 6.0, 7.2, 8.4, 9.6, 10.8
Repetition Rate	100 kHz – 1 MHz
Power Stability	< 5% RMS over 1hr
Electrical Power	110/230 V, 20 A (x2)
Photon Flux	*Full intrinsic source bandwidth ~40 meV*
@ 7.2 eV	10^{12} ph/s after monochromation
@ 10.8 eV	10^{9} ph/s after monochromation
Dimensions (mm)	1500 L x 750 W x 340 H



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LEADING IN ULTRAFAST

Hyperion VUV

The **Hyperion VUV** is the first tunable commercial femtosecond source in the vacuum ultraviolet (VUV) region. Discretely tunable from 6.0-10.8 eV, Hyperion VUV enables you to study a wide range of materials and materials properties. For example, in angle-resolved photoemission (ARPES) experiments, this tunability allows researchers to distinguish surface effects from bulk effects. For time-of-flight (ToF) studies of molecules, the tunability can distinguish otherwise identical isomers through their photoionization threshold energies.

The Hyperion VUV is “application ready”, with appropriate focusing and beam-steering elements that will enable fast integration with your experimental apparatus. The Hyperion VUV can be used with a window between the source and the experimental for ultrahigh vacuum (ARPES) applications.

Applications

- Angle-resolved photoemission spectroscopy (ARPES)
- Time-resolved ARPES
- Photoemission electron microscopy (PEEM)
- Photo-ionization mass spectroscopy (PIMS)
- Molecular time-of-flight (ToF) studies
- Applications that require tunable VUV light
- Applications that require femtosecond pulses of VUV light

Features

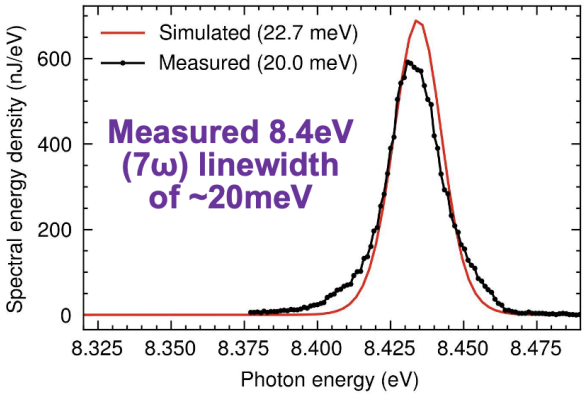
- Discretely tunable 6.0-10.8 eV
- Highly focusable laser-like source
- High energy resolution (<10 meV)
- Large k-space coverage
- High momentum resolution
- Ultrafast <200 fs duration

Benefits

- Discrete tunability of the photon energy overcomes the limitations of fixed wavelength sources, bringing the power of the synchrotron to the laboratory
- Near diffraction-limited beam can achieve a small spot size to measure many types of samples, including materials that are polycrystalline, spatially inhomogeneous, faceted, or simply very small
- Femtosecond pulse durations to probe ultrafast dynamics of molecules and materials
- 1 MHz repetition rate enables rapid data collection and avoids space-charge effects

Coming Soon

NEW ultrabright VUV source at ~8.4eV with ~20 meV linewidth



References

1. Couch et al., "Ultrafast 1 MHz vacuum-ultraviolet source via highly cascaded harmonic generation in negative-curvature hollow-core fibers," Optica **7**, 832 (2020)
2. Couch et al., Detection of the Keto-Enol Tautomerization in Acetaldehyde, Acetone, Cyclohexanone, and Methyl Vinyl Ketone with a Novel VUV Light Source. Proc. Combust. Inst. **38**, 1737 (2021)
3. Rogers et al., Diol isomer revealed as a source of methyl ketene from propionic acid unimolecular decomposition, Int. Journal of Chemical Kinetics **53**, 1272 (2021)
4. US Patent 11,209,717
5. Thurston et al., Narrow Linewidth Tabletop Vacuum-Ultraviolet Laser at 8.4 eV, Frontiers in Optics + Laser Science, paper FTu6E.3 (2024)

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