

Realization of an XUV comb and measurement on its linewidth with frequency comb spectroscopy

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XUV comb has leads to a joint frontier of precision spectroscopy and ultrafast science since its first demonstration in 2005 [1-2]. On one hand, it provides a coherent light source in the XUV region with narrow band width for the first time. This advance paves the way for measuring important atomic transitions in the XUV region [3-4]. On the other hand, ultrafast processes on the attosecond/femtosecond time scale are evolved during high order harmonics generation when the laser intensity inside an enhancement cavity reaches $\sim 10^{13}$ W/cm². Thus, ultrafast dynamics can be revealed with high harmonic spectrum, coherence measurements, etc., with the benefit of high repetition rate. In this work, we report on the realization of an XUV comb at Innovation Academy for Precision Measurement Science and Technology, CAS, and the direct frequency comb spectroscopy of a single-photon transition in Xe/NO₂ near 148 nm. Our work demonstrates that XUV comb is a potentially powerful tool with narrow linewidth for atomic/molecular spectroscopy in the VUV/XUV region.

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[3] A. Cingöz et al., Nature, 482, 68(2012).

[4] A. Ozawa et al., Phys. Rev. A, 87, 022507(2013).

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