Attosecond streaking and its application to Argon Auger decay lifetime measurement

Shuyuan Hu, PhD applicant
CREOL, the College of Optics and Photonics
University of Central Florida, Orlando, USA

The study of electron dynamics in atoms and molecules calls for optical pulses of attosecond duration. We achieved a soft X-ray pulse duration of 53 as and single pulse streaking reaching the carbon K-absorption edge (284 eV) by utilizing intense driving pulses near 1.8-μm center wavelength. Using double optical gating (DOG) method, three times higher HHG flux compared to polarization gating is obtained. By measuring the streaking spectrogram between Auger decay rate and IR pulse with our 6.85 m time-of-flight (TOF) spectrometer, the Argon Auger decay lifetime is determined and its experimental status is reported here.