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Developing a High-Flux Isolated Attosecond Pulse Source[1] ANDREI KAMALOV, MATTHEW WARE, PHILIP BUCKSBAUM, JAMES CRYAN, PULSE Institute, SLAC National Accelerator Laboratory — High harmonic based light sources have proven to be valuable experimental tools that facilitate studies of electron dynamics at their natural timescale, the attosecond regime. The nature of driving laser sources used in high harmonic generation make it difficult to attain attosecond pulses that are both isolated in time and of a high intensity. We present our progress in commissioning a beamline designed to produce high-flux isolated attosecond pulses. A multistep amplification process provides us with 30 mJ, 25 fs pulses centered around 800 nm with 100 Hz repetition rate. These pulses are spatially split and focused into a gas cell. A non-collinear optical gating scheme is used to produce a lighthouse source of high harmonic radiation wherein each beamlet is an isolated attosecond pulse. A variable-depth grazing-incidence stepped mirror is fabricated to extend the optical path length of the older beamlets and thus overlap the beamlets in time. The combined beam is tightly focused and ensuing mechanics will be studied with an electron spectrometer as well as a xuv photon spectrometer.

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Andrei Kamalov
PULSE Institute, SLAC National Accelerator Laboratory

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