

4. Conclusions

We have demonstrated an important step for future attosecond dynamics studies by generating isolated attosecond pulses with variable center frequency. XUV and VUV pulses with 114 as duration (26-67 eV) and 395 as duration (16-25 eV), respectively, were characterized. The tunability of isolated attosecond pulses will allow a greater variety of dynamics in atoms and molecules to be studied. In addition, the characterization of an isolated attosecond pulse (118 as duration, 26-67 eV) with a streaking measurement using a 400 nm streak field was demonstrated for the first time. The implementation of a compact MZ type interferometer allows either 750 nm or 400 nm streak fields to be generated while producing a stability of 54 as time jitter over 24 hours. In future experiments, the compact interferometer located outside of the vacuum chamber will easily allow the use of birefringent optics to produce elliptically polarized fields, the use of sum/differential frequency generation, the introduction of optical parametric amplifier pulses [28], the use of an adaptive spatial light modulator [29], etc. The increased flexibility of both the isolated attosecond field and the probe field will greatly extend the capabilities of attosecond applications.

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