

Abstract Submitted
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Studies in Above- and Below-Threshold Harmonics in Argon with an Infrared Femtosecond Laser.¹ ANDREW CHEW, YANCHUN YIN, JIE LI, XIAOMING REN, ERIC CUNNINGHAM, YI WU, ZENGHU CHANG, Univ of Central Florida — We investigate and compare the above- and below-threshold harmonics in Argon gas using our recently-developed 1 kHz, two-cycle (11.4 fs), 3mJ, and carrier-envelope-phase(CEP)-stable laser at 1.6 μm . Such ultraviolet pulses can serve as pump or probe for studying dynamics in atoms and molecules. Unlike high harmonics with photon energy well above the ionization potential, the mechanism for generating harmonics near the ionization threshold is still under intense investigation. Previous work by Chini et. al. on below-threshold harmonics was done using a 0.8 μm few-cycle Ti:Sapphire spectrally-broadened source with energy up to 300 μJ . It has been predicted by theory that free-free transitions dominate the below threshold harmonic generation as the laser wavelength increase from near infrared to mid-infrared. We are therefore interested in investigating how using a longer wavelength laser might lead to changes to the behavior of below-threshold harmonics when we vary various parameters. We report the π -periodicity CEP dependence and ellipticity dependence of the above- and below-threshold harmonics.

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