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Semi-classical theory of diffraction imaging in strong laser fields
RYAN MURRAY, University of Waterloo, MISHA IVANOV, National Reseach Council — We present an analysis of how intense, few-cycle infrared laser pulses can be used to image the structure of small molecules with nearly 1 fs temporal and sub-Å spatial resolution. We perform numerical calculations using semi-classical techniques to obtain diffraction images of monatomic and diatomic nuclei. We then compare this to fully quantum calculations. We also discuss the strengths and weaknesses of our method, and why the semi-classical approach is more tractable than typical quantum calculations.

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