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Separation of target structure and medium propagation effects in high-harmonic generation of Ar and N_2[1] CHENG JIN, ANH-THU LE, C.D. LIN, Physics Department, Kansas State University — We calculate high-harmonic generation (HHG) by intense infrared lasers in atomic and molecular targets taking into account the macroscopic propagation of both fundamental and harmonic fields. We demonstrate that these ab initio calculations are capable of accurately reproducing available experimental results for isotropic and aligned target media despite the sensitivity of HHG spectra to the experimental conditions. We further show that the simulated (or experimental) HHG spectra can be factored out as a product of a "macroscopic wave packet" and photo-recombination transition dipole moment where the former depends on the laser properties and the experimental conditions, while the latter is the property of the target only. The factorization makes it possible to extract target structure from experimental HHG spectra, and for ultrafast dynamic imaging of transient molecules.

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