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Experimental studies of the interaction of atoms and molecules with intense VUV pulses JEROEN VAN TILBORG, TOM ALLISON, MARC HERTLEIN, ANDY AQUILA, ROGER FALCONE, ALI BELKACEM, Lawrence Berkeley National Laboratory — We will present the latest experimental results and plans on our sub-terawatt-driven HHG sytem. Photons of energy in the 30-100 eV range are produced by propagating 40 fs, 20 mJ laser pulses through a cm-scale gas cell. After focusing of such VUV pulses, peak intensities can reach 10^{13}-10^{14} W/cm^2, enabling nonlinear processes such as two-photon absorption to become detectable. In addition, intrinsic synchronization between laser and VUV photons allows for ultra-fast pump-probe experiments. We will discuss the details on the VUV characterization, such as spectrum, conversion efficiency, spatial profile, and energy detection. Also, we will present preliminary results from experiments in which ions from the focus of the VUV pulse (in presence of gas from a gas jet) are detected with a time-of-flight system. Fragments from dissociation of target gases such as C_2H_2, C_2H_4, N_2, Ar, and Xe are studied.

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