

Coincidence experiments with XUV laser pulses

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Recent results of reaction microscope (REMI) measurements with FEL and laser-generated XUV pulses will be presented. The combination of the REMI (or COLTRIMS) technology, that allow the coincident detection of several ions and electrons, with these new light sources enables detailed studies on the fragmentation of atoms and molecules at light intensities of 10^{14} W/cm² or more, and thus reveals insight into the coupling of light with matter in general. Among many possible routes for investigations, pump-probe experiments with molecules allow for the observation of rotational, vibrational and electronic excitations in real time, and first time-resolved experiments with atoms using intense fs XUV Laser pulses are very promising in view of a long-standing goal, namely the visualization of electronic motion (wave packets) in bound systems. Next to selected results possible future applications for FEL based REMI experiments also the technical hurdles and difficulties will be discussed.