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Control of ionization rates of H2+ by single cycle pulses timed with respect to molecular motion ANDREA BURZO, ALEXEI SOKOLOV, Department of Physics and Institute for Quantum Studies, TAMU — Photo-ionization with single-cycle pulses is a first step toward studying atomic dynamics on the time scale of electronic motion. Previous work has shown that it is possible to produce a train of identical single cycle pulses, perfectly synchronized with molecular motion and separated by an integer (4 or 9) of molecular periods. These pulse trains can be used for studying multiphoton ionization on a few femtosecond timescale. If the input field frequencies are a multiple of their frequency difference, then processes of different order will interfere, leading to a complex dependence of ions signal for different sub-cycle pulse shapes. We are studying how the ionization probability will change as a result of different time delays between the laser pulses and molecular motion. As a result, one can control the ionization rates by adjusting the arrival of the pulses with respect to the molecular motion.

Andrea Burzo
Department of Physics and Institute for Quantum Studies, TAMU

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