Dynamical Electron Vortices in Attosecond Double Photoionization of H$_2$*

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Kinematical electron matter-wave vortices have been predicted in both single [1, 2] and double [3, 4] ionization of He. They have been observed experimentally in multiphoton single ionization of K [5, 6]. We present in this talk results of a study of a new kind of *dynamical* electron vortices [7]. Specifically, we study electron momentum vortices in single-photon double ionization of H$_2$ by time-delayed, counter-rotating, elliptically-polarized attosecond pulses propagating either parallel or perpendicular to the molecular axis. For the parallel configuration, *kinematical* vortices occur similar to those found for He [1-4] and K [5, 6]. For the perpendicular configuration, we find *dynamical* vortex structures originating from an ellipticity-dependent interplay of $^1\Sigma_u^+$ and $^1\Pi_u^+$ continuum amplitudes. We propose a complete experiment to determine the magnitudes and relative phase of these amplitudes by varying the pulse ellipticities and time delays.

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