Circularly Polarized Attosecond Pulses and Atto-Magnetism KAI-JUN YUAN, ANDRE BANDRAUK, Departement de Chimie, Faculte de Sciences, Universite de Sherbrooke — We present a method for producing a single circularly polarized attosecond pulse by an intense few cycle elliptically polarized laser pulse combined with a mid-infrared laser pulse from numerical solutions of the time dependent Schrödinger equation for aligned H$_2^+$. Simulations show that in the intense mid-infrared laser field with frequency 62.5 THz (wavelength $\lambda = 4800$nm) and intensity $\sim 10^{14}$W/cm$^2$, a single circularly polarized 114 as pulse can be generated by an elliptically polarized 400nm and $5\times 10^{14}$W/cm$^2$ laser pulse with ellipticity 0.59. With such generated ultrashort circularly polarized pulses, localized “spinning” electron wave packet can be created on the attosecond time scale and the sub-nanometer molecular scale, leading to time dependent electronic currents and attosecond magnetic fields inside molecules. It is shown that with an intense circularly polarized attosecond UV laser pulse with intensity $10^{16}$W/cm$^2$, a strong magnetic field with several tens of Teslas can be induced.