Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Measurement of ultrafast magnetization dynamic in iron, using a novel imaging spin detector, in combination with a compact pulsed VUV source[1] RAFAEL GORT, KEVIN BUHLMANN, ANDREAS VATERLAUS, YVES ACREMANN, ETH - Zurich — As ultrafast demagnetization is partially a spin transport effect, the continuously growing field of spintronics is related to femtosecond magnetization dynamics. Energy resolved photoemission experiments in principle provide the possibility for direct observation of the electrons that contribute to the macroscopic magnetization. However, for a long time spin detectors have not been efficient enough for spin and time resolved electron spectroscopy of the entire valence band. The development of imaging spin detectors increase the detection efficiency by several orders of magnitude compared to the well-known Mott spin detector. A spin detector has been developed, where spin selectivity is achieved by low energetic electron scattering at a Iridium crystal. In addition, a very compact and stable high harmonic source has been designed, with the goal of delivering short VUV pulses for just one single harmonic of the driving laser. We present first measurements of spin and time resolved photoemission spectra of ultrafast demagnetization in iron. We intend to compare the spin dynamics of electrons at the Fermi energy to the laser-induced change of the exchange splitting. This will lead to deeper insights into transport phenomena within the valence band.

[1]Swiss National Science Foundation

Rafael Gort
ETH - Zurich

Date submitted: 08 Nov 2016 Electronic form version 1.4