

# FIRST EXPERIMENTS WITH FEMTOSECOND SOFT X-RAY PULSES AT BESSY

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## Abstract

The undulator based femtoslicing source at BESSY II provides soft X-ray pulses of less than  $150 \pm 50$  fs with linear and circular polarization in the photon energy range 400 - 1200 eV. Our experimental setup is based on the laser pump - soft X-ray probe technique. It allows the study of the dynamical behaviour of X-ray absorption on a sub-ps time scale. As an effect of pump laser heating we have observed a change of the absorption line shapes at the 2p edges of Fe and Ni. The magnitude of the change follows the temporal evolution of the electron temperature of the samples. This can be used to determine the time resolution of the slicing setup. The line shape effect has the potential to serve as a photon-in / photon-out mechanism to cross-correlate X-rays from FEL sources with fs laser pump pulses. Using X-ray magnetic circular dichroism (XMCD) we have investigated the ultrafast magnetization dynamics of ferromagnetic Ni. Upon laser induced demagnetization a minimum of XMCD at the Ni L3 edge appears within  $400 \pm 100$  fs.

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