ESRF	**Experiment title:** Localization of magnetic atoms in intermetallic alloys using kinematical X-ray standing waves	**Experiment number:** MI-1017
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Report:

In this beamtime we performed kinematical X-ray standing waves (KXSW) measurements with circular polarized X-rays at different magnetic polarizations of the sample. The main purpose of this experiment was the proof of principle of a new method that combines XMCD and KXSW. As sample we used a single crystalline ferromagnetic NiPt alloy. We measured the Pt L fluorescence for different combinations of the direction of applied magnetic field and helicity of incident X-rays while scanning the angle of incidence around the (111) Bragg angle.

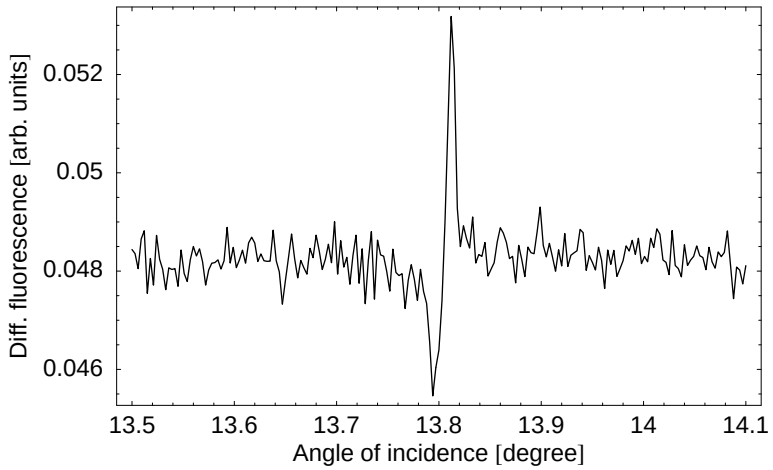

Figure 1: Differential fluorescence yield measured at the Pt L_3 edge around the (111) Bragg reflection. The constant background corresponds to the conventional XMCD effect. The strong oscillation around the Bragg angle is caused by standing waves inside the crystalline lattice.

Figure 1 shows the difference signal for opposite magnetic polarizations of the sample. At the Bragg angle a strong variation of the secondary signal is observed. Unfortunately this change in intensity is not only caused by magnetic effects, but also by the mechanical instability of the sample stage. Due to the magnetic forces the sample moved slightly when the magnetic field was changed. This movement was comparable with the half width of the reflection curve, which could not be measured with the available sample chamber. Therefore this offset of the angle scale cannot be corrected and it is impossible to separate the magnetic and the mechanical effect.
Thus, the experiment was successful as a proof of principle. It also allowed us to develop an experimental procedure for the new type of experiments. Based on this experience, we have designed and built a specialized mobile double-circle spectrometer which we plan to use in the next experiment.