



**Soft x-ray magnetic diffraction with coherent beams:
towards magnetic speckle spectroscopy**

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Traditionally, x-ray diffraction was a matter of hard x-rays. Currently, this situation is changing by the growing awareness that the spectroscopic information contained in soft x-ray edges can be exploited in anomalous scattering experiments to obtain electronic or magnetic information on nanometer length scales. Thus, it has recently become possible to study the magnetic domain structures in thin films and surfaces using soft x-ray magnetic scattering experiments. With the present flux and detectors, soft x-ray diffraction experiments can resolve magnetic domain structures with a resolution of 30 nm. A unique feature of this technique compared to microscopic techniques is the possibility to obtain 3 dimensional information.

The next step in this development is the exploitation of the coherence available at third generation sources. In this talk we will demonstrate the possibility to obtain sufficient coherent flux to obtain magnetic x-ray speckle patterns from static magnetic domain structures in thin films. Possible applications of speckle spectroscopy for the study of magnetic fluctuations will be discussed.