## Structural, electronic and magnetic properties of ultrathin epitaxial ferrite films studied with synchrotron radiation

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Ferrites are important in different fields due to their outstanding physical and chemical properties. On the one hand, they are relevant in the field of catalysis in which they are used for, e.g., the water gas shift reaction. On the other hand, ferrite films are important in the field of spintronics due to their magnetic properties as, e.g., high Curie temperature and high spin polarization. In addition, the electronic properties may vary from halfmetallic to insulating. Thus, ultrathin films can be used for, e.g., magnetic tunnel junctions and spin valves.

Here, it will be reported on studies on ultrathin ferrite films with focus of experiments based on synchrotron radiation. For instance, x-ray diffraction (XRD) is used to determine the structure of the films and to shed light on strain effects. In addition, also operando XRD shows the evolution of the film structure during early stages of heteroepitaxy. The electronic structure of the "bulk" of the ultrathin films and the cation distribution in the films is studied by hard x-ray photoelectron spectroscopy (HAXPES). Magnetic properties and cation order are investigated combining x-ray absorption spectroscopy (XAS) and x-ray circular dichroism (XMCD). Therefore, electronic and magnetic properties can be related to structural properties of the ultrathin ferrite films.