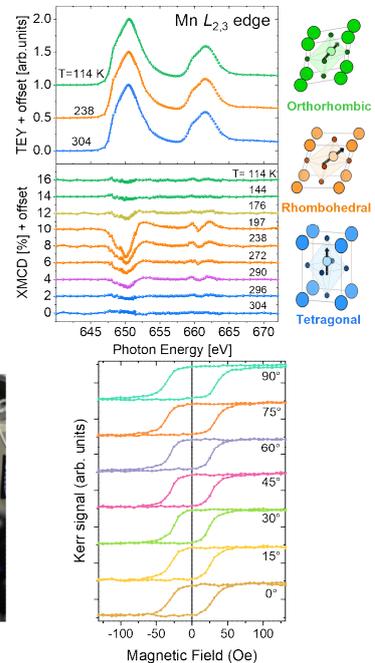


Investigation of electronic and magnetic properties of 2D quantum materials via x-ray magnetic circular dichroism



In state-of-the-art experimental research, a huge interest is rising in determining the interplay between the electronic and magnetic properties of complex 2D materials. Such class of materials includes multiferroic heterostructures, strongly correlated oxides and 2D van-der-Waals materials.

The goal of the thesis is to deposit and/or characterize the electronic and magnetic properties of such materials. The candidate will be part of APE-HE, a dynamic and young group of research part of IOM-CNR, inside the facility of Elettra synchrotron in Trieste.

During the thesis, the student will be involved in the full experimental study of the materials, starting from the deposition of ferromagnetic layers by electron beam evaporation sources on piezoelectric and ferroelectric substrate and continuing to their characterization and data analysis. The candidate will be fully involved in the investigation of the electronic and magnetic properties of the heterostructures under different conditions (i.e. temperature, substrate polarization, strain, etc...). In order to do so, the candidate will perform magnetic characterizations such as magneto-optic Kerr effect (MOKE) and magneto-resistance measurements, structural characterizations such as x-ray photoemission (XPS), x-ray diffraction (XRD) and low energy electron diffraction (LEED). The candidate will also manipulate innovative materials with the use of a glovebox, closely connected to the rest of the experimental chambers. The candidate will have direct access to the APE-HE beamline at Elettra synchrotron, where he/she will become an expert in x-ray absorption spectroscopy (XAS) and x-ray magnetic circular dichroism (XMCD).

As part of the research group, the student will also take part to experiments at other beamtimes at international synchrotrons, and will attend schools and international conferences.

The PhD candidate, with a background of Solid State Physics, is expected to be willing to engage in experimental development, with a curious spirit and positive interaction with the group. A background in magnetism is a plus.

We kindly invite you to write us for further information on the thesis project and for planning a visit to our laboratory.

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