MaMaSELF

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Electronic Characterization of Functional Oxides using advanced photoemission spectroscopy techniques

The properties of the La2/3Sr1/3MnO3/SrTiO3 (LSMO) interface have been subject of interest since the discovery of the possibility of use this composite as a magnetic tunnel junction (MTJ) due to its half-metallic character in its ferromagnetic phase, which leads to high tunnel Magnetoresistance (TMR) effect. By other side, interesting studies on polar metals in thin films of perovskite nickelates (ANiO3) have been done in order to understand their properties, such as anisotropic thermoelectrical responses and magnetoelectric multiferroicity. Specifically, for NdNiO3 (NNO), metal insulator transition (MIT) has been observed awaken the interest of studding its electronic structure as a function of temperature.
In this project, advanced photoemission spectroscopy techniques are used to characterize the electronic structure of LSMO and NNO oxides. Angled-Resolved Photoemission Spectroscopy (ARPES) is used to obtain the electronic band diagram of NNO thin films. Parallel to this experiment, the study of the band alignment and chemical states as a function of applied bias and barrier type in LSMO oxides is performed by the HArd X-ray PhotoElectron Spectroscopy (HAXPES) technique. These experiments reflect the power of the photoemission spectroscopy as a method for understand the electronic structure of solids.

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