Angle-resolved photoelectron spectroscopy studies at synchrotron light sources

Paolo Moras
[1]*Istituto di Struttura della Materia-CNR, SS14,Km 163,5,Trieste, 34149, ITALY*

email: paolo.moras@ism.cnr.it

Photoelectron spectroscopies are experimental methods based on the exploitation of the photoelectric effect, i.e. the ejection of electrons (photoelectrons) form materials irradiated by sufficiently energetic light. These techniques allow direct determination of chemical composition, density of states, band dispersion, Fermi surface, spin polarization and electron/spin dynamics, which define the electronic, magnetic, optical and transport properties of solids systems. In this talk I will present recent trends of photoelectron spectroscopy studies, in connection with the development of new electron detection systems. Special emphasis will be put on angle-resolved photoelectron spectroscopy (ARPES) and its extensions to the analysis of microscopic systems and the determination of spin polarization. ARPES plays a relevant role in the scientific programs of low and mid-energy synchrotron light sources like Elettra. Indeed, five beamlines at Elettra use ARPES as the main investigation technique and few others as a secondary technique. I will go through the rich offer of instrumentation of these beamlines and discuss several scientific cases in which ARPES is used to probe fundamental properties of matter.