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LOREA: the ARPES beamline at ALBA in operation

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LOREA ('flower' in basque language), the ninth beamline of the ALBA synchrotron radiation source, started its operation in 2021 and is dedicated to electronic structure investigation by means of Angle Resolved Photo-Emission Spectroscopy (**ARPES**).

The beamline covers the photon energy range of 10-1000 eV, with continuously variable polarization, resolving power of more than 10^4 in the whole range, and a spot size of about $10 \times 10 \mu\text{m}^2$. The estimated photon flux is of the order of 10^{13} (ph/s/0.1%BW) for photon energies up to 350 eV, and above 10^{12} (ph/s/0.1%BW) in the 350-1000 eV energy range. LOREA is suitable for high resolution VUV ARPES investigation in the range of 10-200 eV, Soft X-ray ARPES in the 200-600 eV energy range, and core level spectroscopy, resonant photoemission and X-ray absorption spectroscopy in the whole energy range.

LOREA uses an MBS A-1 hemispherical analyzer with high energy resolution (better than 1meV) and the fast Fermi surface mapping mode. It has been recently upgraded with a spin detector to allow spin-resolved ARPES.

The 6-axes cryo-manipulator can reach low temperatures better than 7.5K and the sample stage is provided with 4 electrical contacts for I-V characterization of simple devices.

The main chamber of LOREA is connected to a central radial distribution chamber and, through it, to all other vessels, including chambers for in situ UHV deposition and characterization, fast entry load lock and sample storage, docking of vacuum suitcases, docking of STM.

The transfer between chambers is completely automatic, and is based on the tango control system.

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No

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