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Extreme condition beamline at SIRIUS to study rare-earths and actinides

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The EMA beamline (Extreme condition x-ray Methods of Analysis) is one of the hard x-ray undulator beamlines within the first phase of the new synchrotron source in Brazil (Sirius project). This beamline is thought to make a difference where a high brilliance is essential, which is the case for extreme pressures that require high photon flux in a small focus. The beamline will cover both spectroscopy (XMCD / XANES) and diffraction techniques under extreme pressure and temperature conditions for the sample. In addition to the description of the beamline, in order to motivate it I will also present our recent works studying magnetism of actinides and rare earths using X-ray magnetic circular dichroism technique. I will show how to use this technique to directly access the electronic structure of the 5f/4f and 6d/5d orbitals which regulate the macroscopic properties of the kind of systems.

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