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XRF Spectroscopy with VOXES: Techniques, Optimization and Applications

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X-rays are a standard tool for investigating the properties of metals, from determining their concentrations to probing their specific electronic states. At the National Laboratory of Frascati (LNF), the VOXES apparatus pursues this approach by implementing an X-ray fluorescence (XRF) spectrometer for extended sources. In this talk, I will present the capabilities of VOXES, highlighting its versatility across different XRF techniques. I will begin with energy-dispersive XRF (ED-XRF), focusing on its application within the MITIQO project at LNF, for measuring metal concentrations in wine, which enables geographical origin identification. Then, I will discuss wavelength-dispersive XRF (WD-XRF) applications, including ongoing optimizations aimed at improving the limit of detection and the development of lab-based spin-selective X-ray emission spectroscopy (XES).

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