

HR: 16:15h

AN: **MR24A-02**

TI: [Oscillation Laue Analysis \(OLA\) - A new crystal structure determination method for mineral physics](#)

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AB: We present a new approach for collection and interpretation of polychromatic radiation diffraction images, called Oscillation Laue Analysis, which combines capabilities of single crystal X-ray diffraction and X-ray absorption spectroscopy. The method is based on smearing Laue reflections into variable-energy curves by slight oscillation of the crystal during the exposure. The OLA method allows for simple and precise peak energy determination and harmonic overlap deconvolution through measurement of X-ray attenuation coefficient of metal foils inserted into incident beam. The method provides an easy reliable way of determining unit cells of unknown single-crystal phases, yields multiple monochromatic structure factor sets covering wide range of energies, which can be used for Multiple Anomalous Dispersion (MAD) based structure solution or enhancement of contrast between neighboring elements in the periodic table, and allows the routine ab initio solution of unknown structures. The results of our first experiments, performed at sector 16 of the Advanced Photon Source Laboratory, and aimed at determination of the compression mechanism of escolite (Cr₂O₃) will be presented and discussed in the context of application of the new approach in micromineralogy, characterization of meteoritic samples, and high-pressure mineral physics.