

Apparent Anti-resonance in X-ray Fluorescence Spectroscopy

Thursday, November 14, 2024 1:00 PM (1h 30m)

X-ray fluorescence has been widely utilized in synchrotron X-ray spectroscopies including X-ray absorption or emission spectroscopy. The fluorescence yield (FY) counts the emitted X-rays originated from elastic or inelastic processes, and the intensity profile of the FY signal as a function of the X-ray energy contains the information on chemical states and excited electronic structure of the specimen. Interestingly, it is often observed particularly for certain narrow energy range in the metal L-edge X-ray absorption spectra that such fluorescence signals become very weak or even appear to be negative (lower than the background level). The weakness in FY signal can be explained by over-absorption (or self-absorption) effect. However the apparently negative resonance has not been addressed well. In this presentation, I would like to argue that an interference between the sharp absorption resonance and the background signals can induce such apparent anti-resonance (dips) particularly for localized orbital states in highly concentrated atomic species as in transition metal compound single crystals.

Paper submission Plan

Yes

Best Presentation

No

Contribution track

ICABU WG3. Beamline and Instrumentation

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