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The use of soft X-ray diffraction for native-SAD and for chromatic exploration of uncharted aspects of metals in macromolecules: A new pilot program at the APS

Native-SAD phasing uses the anomalous scattering signal of atoms in the crystalline, native samples of macromolecules, collected from single wavelength X-ray diffraction experiments. Advances in technology and methodology during the past five years show great promise in making Native-SAD phasing a routine approach for future macromolecular structure determination using X-rays with wavelengths longer than 1.5 Å. Another use of the X-rays in this wavelength region is to collect multiple sets of diffraction data across a metal's absorption edge as one does in X-ray Absorption Spectroscopy (XAS). The diffraction based approach differs from XAS in that a complete 3-dimensional diffraction data set is recorded at several points spanning the metal's absorption edge. The approach provides both positional and spectroscopic information relating to individual metals in the crystal by diffraction. A Pilot Program was initiated at the APS in January 2016 for General Users to participate in the use of these soft X-ray tools. Theoretical and practical aspects of the above concepts, as well as the procedures for accessing the new Pilot Program through General User beam time will be introduced.

Biography

Bi-Cheng Wang has completed his PhD from the University of Arkansas and Postdoctoral studies from the California Institute of Technology. He currently holds the title of Professor and Ramsey Georgia Research Alliance Eminent Scholar at the University of Georgia. He is the founding Director of SER-CAT (Southeast Regional Collaborative Access Team, which includes the construction and operations of two synchrotron beam lines at the Advanced Photon Source, USA). He has also served as the PI and Program Director of the NIH funded Southeast Collaboratory for Structural Genomics (SECSG). He has published more than 200 papers in peer-reviewed journals.

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