

Phasing with In-house Softer X-ray Radiation

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Many examples of S-SAD and Se-SAD phasing have been reported with data collected with copper radiation ($\lambda = 1.54 \text{ \AA}$) [1,2] and collected at the K absorption edge of selenium [3]. Furthermore, a number of successful SAD experiments using Cr radiation ($\lambda = 2.29 \text{ \AA}$) which can double the anomalous signal compared to Cu radiation have been published by several groups [4,5].

With the addition of Cr radiation to the crystallographer's toolkit, in-house X-ray sources can routinely provide one or two wavelength options. This report discusses the results of both SAD experiments with Cr radiation and Dual-wavelength Anomalous Diffraction phasing (DAD) by combining diffraction data from both Cu and Cr-collected in-house data sets.

We also report the results of data collection with a new imaging plate detector (R-AXIS HR) designed specifically for use with Cr radiation. This new detector allows the collection of data suitable for both phasing and refinement with Cr radiation from a single crystal in one diffraction experiment.

This in-house phasing approach we describe has been given the label know before you go by John Rose and B.C. Wang at the University of Georgia . It provides a method to improve the efficiency of the solution of macromolecular crystal structures and usage of the synchrotron beam time by enabling the collection of phasing data in the home laboratory.

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