

Poster Presentation

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Towards User Operations of SONICC at GM/CA@APS

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Second order nonlinear optical imaging of chiral crystals (SONICC), based on femtosecond laser scanning microscopy, has been implemented at GM/CA@APS undulator beamline 23ID-B for rapid protein crystal localization and centering. The technique is based on infrared laser light impinging on non-centrosymmetric crystals of proteins, which selectively may yield a frequency-doubled, visible signal generated by the anharmonic response of the electron cloud of the protein in response to the laser field. One aim of this method is to locate small crystals grown in opaque crystallization media for centering in X-ray beams of only a few microns or less in cross-section [1]. The optical system implemented at the beamline includes 'trans' and 'epi' detection of Second Harmonic Generation (SHG) signals [2]. In addition, scanning visible laser light across the sample and detecting two-photon excited UV fluorescence (TPE-UVF) provides complementary contrast based on the native fluorescence of proteins. An update on progress towards offering a user-friendly system to users will be provided. Different factors that influence imaging signals and the practice of successfully locating and accurately positioning a crystal via SONICC will be discussed.

[1] D. Kissick, C. Dettmar, M. Becker, et al., *Acta Cryst.*, 2013, D69, 843-851., [2] J. Madden, S. Toth, C. Dettmar, et al., *J Synchrotron Rad.*, 2013, 20, 531-540.

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