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Low Mosaicity Crystals as a Sensitive Probe of Sample Movement at Synchrotron Beamlines. R.W. Alkire, N.E.C. Duke, F.J. Rotella, Biosciences Div., Argonne National Laboratory, Argonne, IL 60439.

Nylon cryoloops are used routinely to hold single-crystal samples during protein crystallographic data collection at synchrotron beamlines. Aside from normal rotational motion, additional movement of cryoloops has been observed, likely from the action of the nitrogen gas stream used to cool samples cryogenically. Experiments were performed on the SBC 19BM beamline at the APS to characterize cryoloop movement. A baseline for the goniometer and timing shutter was established using the measured profile of the 220 reflection from single-crystal silicon rod. 220 reflection profiles from single-crystal silicon cubes, approximately 200 μm on a side and mounted in 20- μm , single-fiber Nylon 66 cryoloops, were recorded. When compared with the silicon rod measurements, cryoloop movement was clearly observed. If shutter timing and synchronization among the goniometer, timing shutter and detector are known and correct, low-mosaicity ($< 0.25^\circ$ FWHM) lysozyme single-crystal samples can be used to probe cryoloop movement. The results of such experiments, including the impact of cryoloop movement on the quality of processed data, will be discussed.

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