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Some Strategies to Get the Best MAD/SAD Data from Synchrotron Beamlines. Xiaoping Dai, Ian Wilson, The Scripps Research Institute, La Jolla, CA.

From the early days of MAD development, strategies to collect the best, most accurate and complete data have always been an important issue for in-house X-ray sources ^[1], to first generation synchrotron beamlines ^[2], and today for second and third generation synchrotron beamlines. I will present recent trials from our lab on how to achieve high quality data from MAD/SAD experiments. Radiation damage is the most serious problem, especially for the brighter beamlines. The damage to the crystal is non-uniform and also time and orientation dependent. So it is very hard to adequately correct the X-ray data. Other key factors to consider are absorption near the absorption edge, energy resolution/stability, as well as exposure time to obtain suitable counting statistics. It is important to note that the best strategy is only best for the individual crystal conditions, such as the size, unit cell and space group of the crystal, its sensitivity to radiation, and diffraction strength and resolution.

[1] Dai, X. (1995), Ph. D. Thesis, UCSD; Ryu, S.-E et al (1990), *Nature*, 348, 419.

[2] Hendrickson, W.A. (1991), *Science*, 254, 51.