

MicroED with a direct electron detector

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A consequence of the small crystals used for microcrystal electron diffraction (MicroED) is that their diffraction patterns are composed of weak diffraction spots. In an effort to reduce radiation damage, the exposure is often reduced, which further exacerbates this effect. Efficient electron detectors are required to accurately recover the information in the diffraction spots, particularly at high resolution. Sensitive detectors, such as the direct electron detectors commonly used for imaging in electron cryo-microscopy (cryo-EM), can help measure the intensities of these weak reflections, but may introduce limitations at low resolution, where reflections tend to be much stronger. This presentation outlines our experiences with various electron detectors and explores the relationship between data collection, data processing, and camera performance. Recent examples of MicroED data from standard proteins will be shown and their improved data quality will be discussed.