Validation and Archival of MicroED data

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Microcrystal electron diffraction (MicroED) data are a collection of images recorded as a movie series from a continuously rotating crystal in a transmission electron microscope operating in diffraction mode. The technique has garnered substantial interest over the years owing to its ability to collect high-quality data from vanishingly small crystals.

However, the instruments used for MicroED are often not optimized for this mode of operation so important metadata information may be missing from the images. The details around data interpretation are in constant flux as cryo-EM is rapidly developing and new cameras often come with new data formats tailored towards various new features. The MicroED processing pipeline therefore includes a step to either complement the metadata with user-supplied information or derive the required information from the provided metadata (*e.g.* sample–detector distance, rotation rate). This demands that users accurately record microscope settings during data collection and raises concerns over user accuracy which may lead to problems with subsequent data analysis. In this presentation we will outline how we use automation to relieve the user of manual bookkeeping and discuss how the field can better ensure that the data collected today could be processed tomorrow.