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Protein Crystallography, present and future detector requirements

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Protein crystallography (PX) is particularly demanding of detector performance and historically it has always been the detector that has been the limiting factor in the majority, if not all, diffraction experiments. Ultimately this is due to the need to obtain data with an excellent signal to noise ratio from samples that are limited in size, inherently weakly diffracting and highly susceptible to radiation damage. The requirements of an “ideal” detector for PX will be presented, and the performance of current commercially available detectors will be assessed in the light of these requirements. From this assessment it becomes clear that hybrid pixel detectors satisfy most of the requirements for many experiments, and very fast readout CCDs are also very promising. The remaining shortcomings will be discussed, together with the special requirements of more novel PX experiments.

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