

Experimental Phasing with FLASH diffraction

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Single particle diffraction has the potential to revolutionize macromolecular structure determination, due to its ease of use, as compared to classical crystallography, and resolution, as compared to electron microscopy, as well as introducing the possibility of studying extremely fast phenomena. But to be able to realize all this potential there needs to be a reliable method for phasing the diffraction patterns obtained. Ab initio phasing that takes advantage of the pattern oversampling has made significant progress^{1,2} but it requires significant human intervention and often it fails to phase certain images. Here we present experimental phasing methods that could be used in conjugation with ab initio phasing to improve its speed and convergence capabilities.

1 – Miao J, Charalambous P, Kirz J, Sayre D. 1999. Extending the methodology of X-ray crystallography to allow imaging of micrometer-sized non-crystalline specimens. Nature 400:342-44

2 – Chapman H et al 2006. Femtosecond Diffractive Imaging with a Soft-X-ray Free-Electron Laser. *Nature Physics* 2:839-43