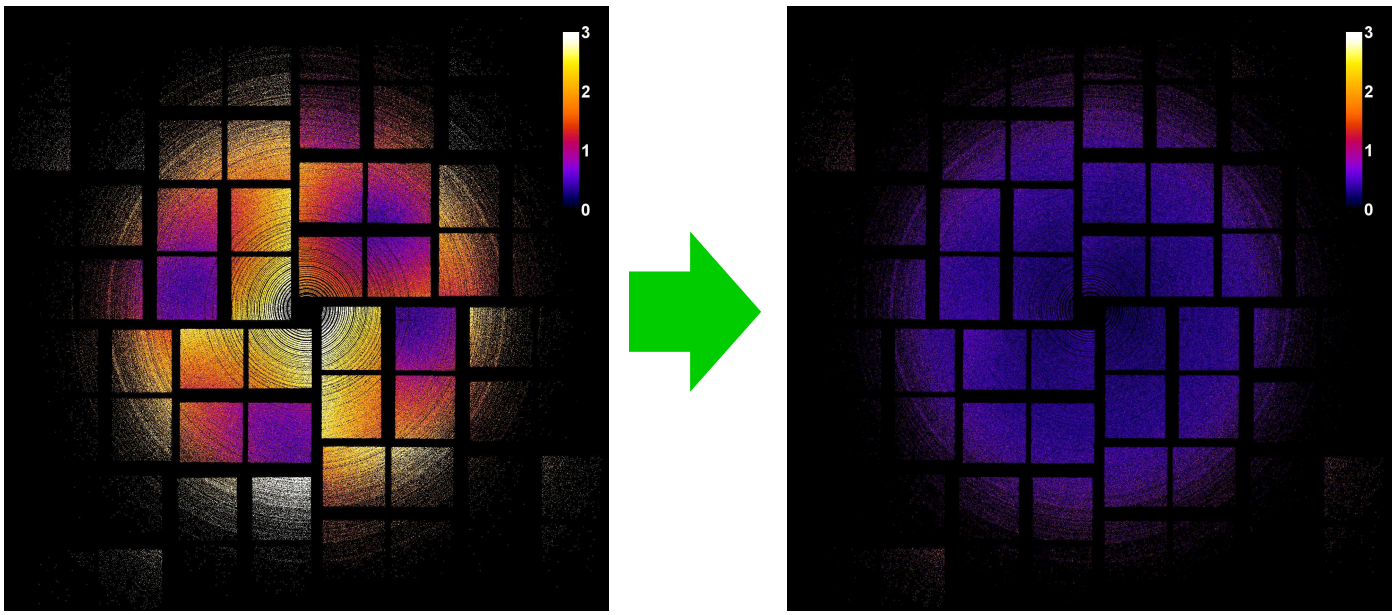
Accurate determination of segmented X-ray detector geometry

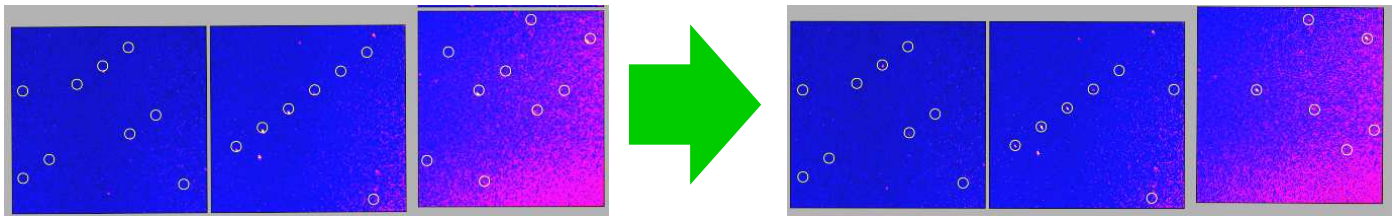
Oleksandr Yefanov, Valerio Mariani, Cornelius Gati, Thomas White, Anton Barty, Henry Chapman
CFEL @ DESY, Hamburg, Germany

The geometry refinement is useful for most of x-ray diffraction experiments at FELs or synchrotrons to find where detector pixels are relative to the sample.

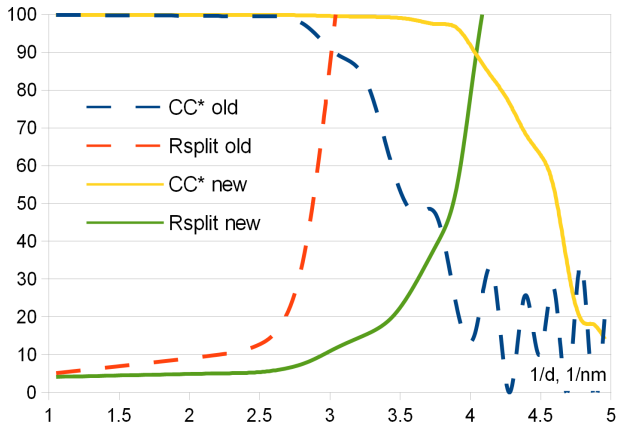
Here is a map of errors in pixels position (value also in pixels) before and after the refinement

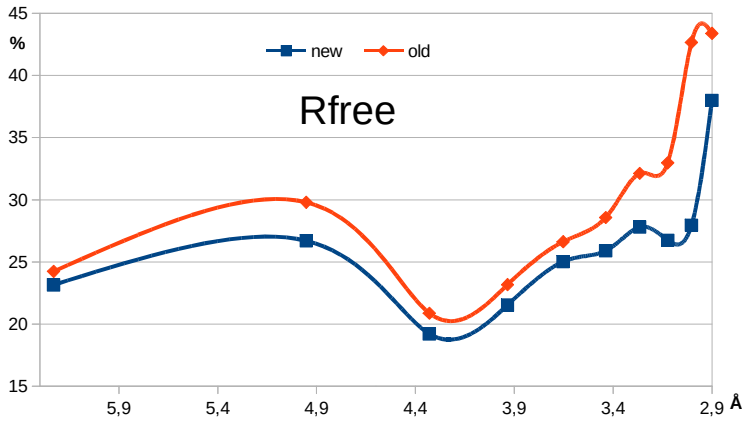


Here is what actually happens with measured Bragg peaks (insde circles):



The effect on crystallography (better resolution):





So knowing the geometry of the experiment actually helps...
The program «geoptimiser» is a part of CrystFEL (version > 0.6.0)