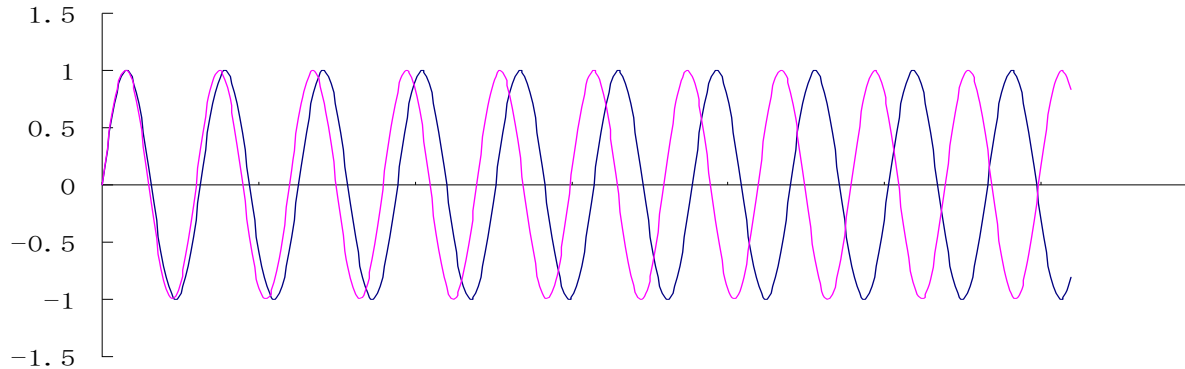


CTF is extremely sensitive to pixel size error

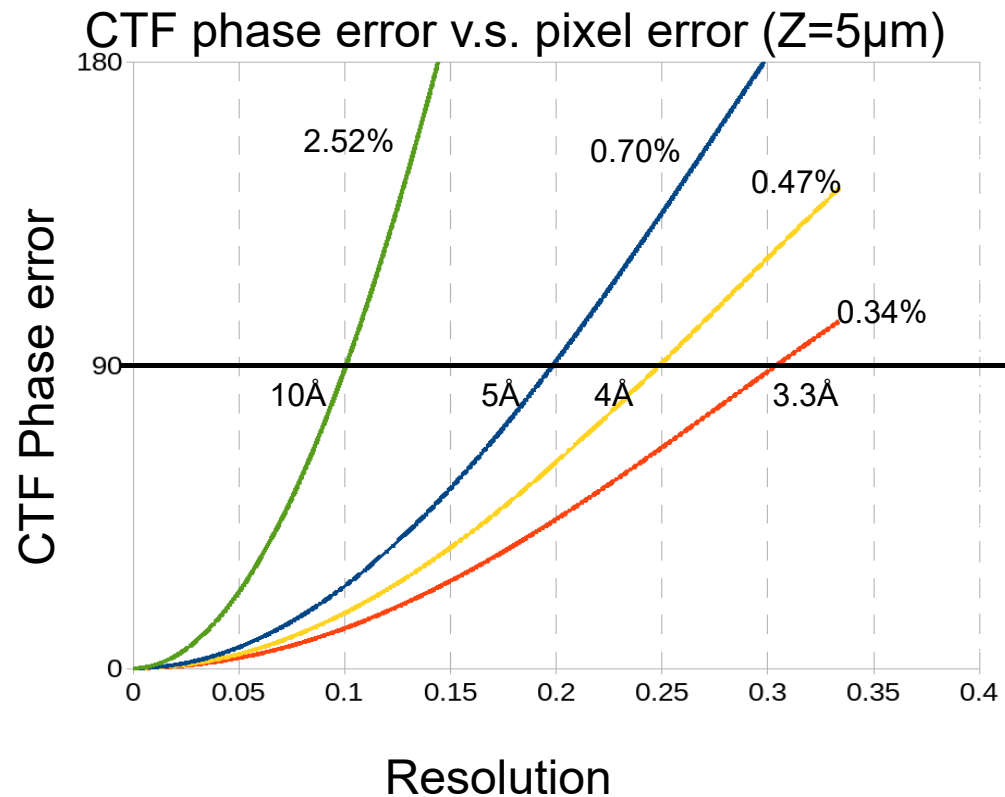
Phase shift due to 1 pixel error in scaling



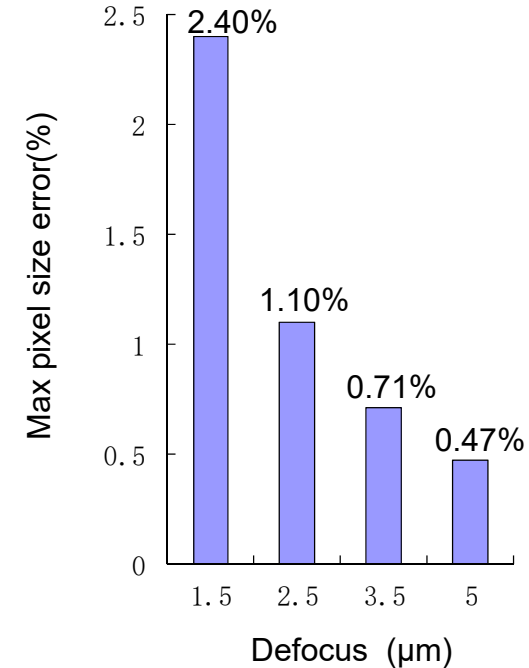
Warning:

180° at Nyquist Res.

90° at 0.5 Nyquist Res.

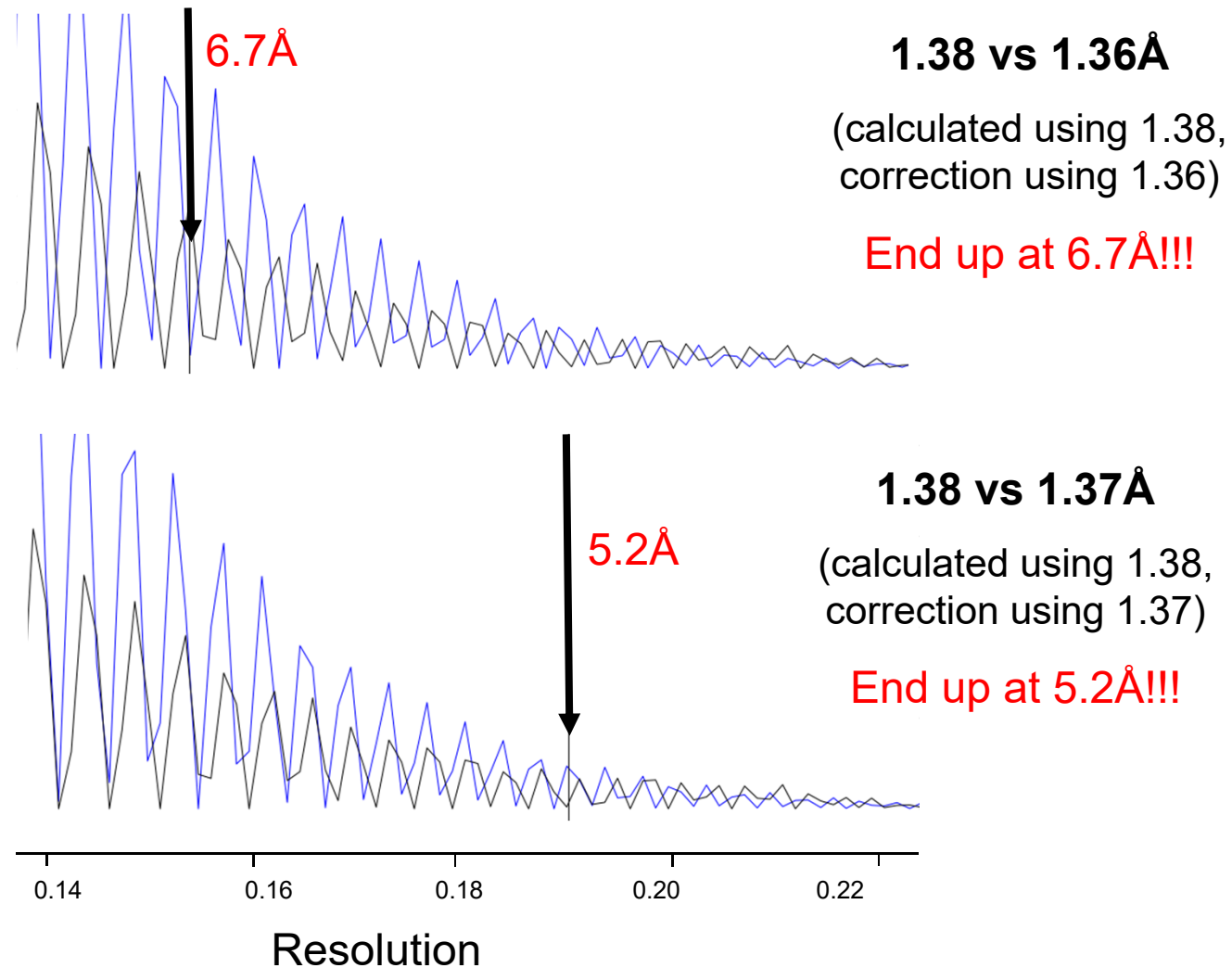


Pixel size error tolerance
(90 degree criterion for 4Å)



CTF is extremely sensitive to pixel size error

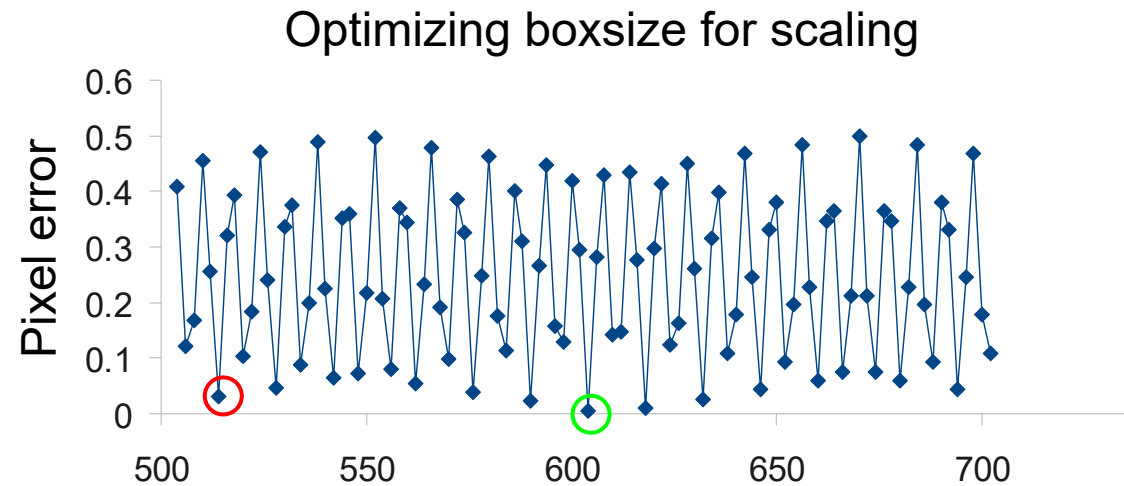
What will happen if using the wrong pixel size?



Strategy for Combining data at diff. Mag.

Strategy for combining data:

1. Independent reconstructions
2. Aligning all to one ref.
3. Calculate CC vs scaling factor
4. Corrected new pixels sizes for all
5. **Optimzing box sizes**
6. **CTF using new pixels for all**
7. Re-extract particles && scaling



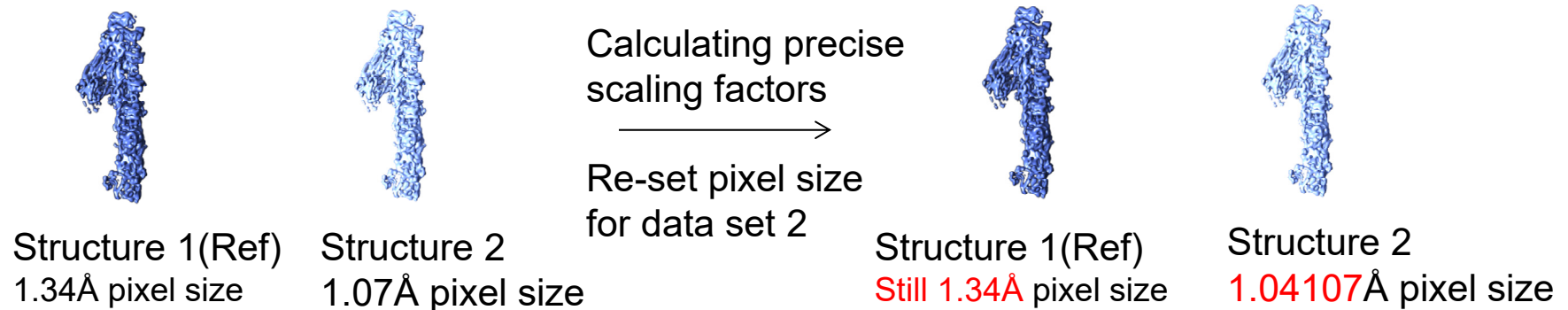
Old box=516 Pixel size=1.04, scaled to 1.34

New box=400.47, large error

Combining data at diff. Mag: Practical Case

Data set1: 1.34Å (reference data: assuming ideal pixel size)

Data set2: 1.07Å (additional data: don't know the precise pixel size, to be updated after reconstruction)



Independent reconstructions

Then CTF parameters of data set 2 needs to be recalculated.