

# Supplemental document

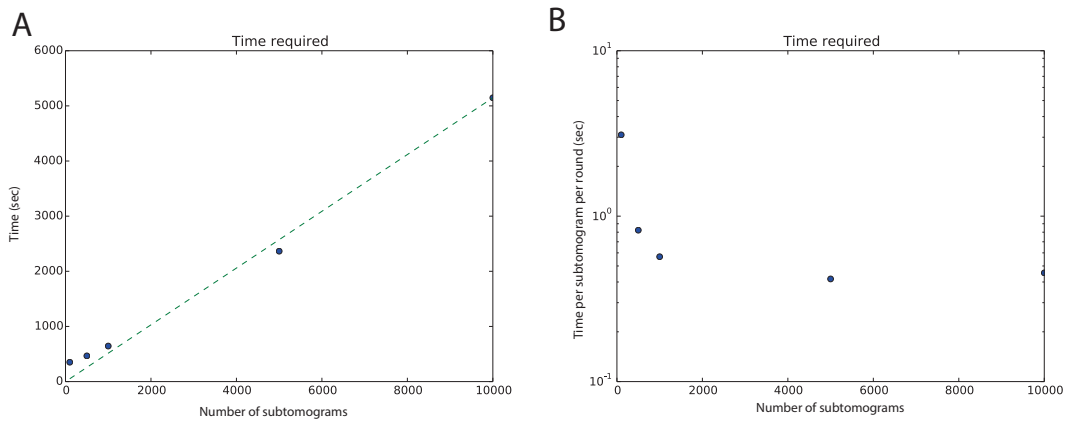


Figure S1: Related to Figure 2. (A) The time required for a single round of alignment and averaging as a function of subtomogram number, for a constant 128 workers. (B) Same as (A), normalized by the number of subtomograms.

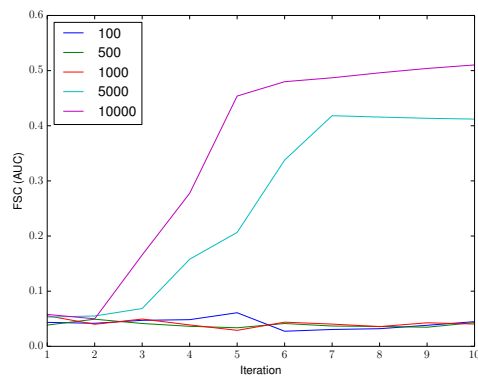


Figure S2: Related to Figure 2. Accuracy of the averaged density maps generated from reference-free alignment and averaging across 10 iterations. The accuracy is measured as the FSC (averaged across different scales) between the generated averages and the template of the true structure. Different curves correspond to the results using different numbers of subtomograms.

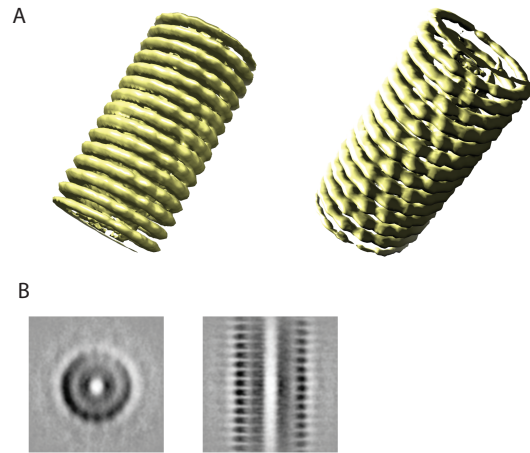


Figure S3: Related to Figure 3. Average of TMV subtomograms. (A) Isosurface. (B) Center slices.