



**Fig. S4. Coordinate system building and the orientation of each cylinder.**

(A,B) The 2-fold symmetry axis was defined as Z axis (green, A). The bottom slice of the map along Z axis was chosen to define the X-Y plane, where X axis is oriented along the bottom rods (B). The centroids of each trimer were presented as beads. The axis of each cylinder is the line with least sum of distances to the centroids of this cylinder.

(C,D) Angles between the axes of APC or PC cylinders and coordinate axes (C) or planes (D).