Formation of nematic order in 3D systems of hard colloidal ellipsoids

Supplementary Information

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Bond order analysis

As described in the main text, we performed a bond order analysis for our data. For this we calculated the order parameter q_4 and q_6 that identify 4-fold and 6-fold symmetries in the 3D positions, following the literature [1].

In figure S1 the data for q_4 and q_6 are shown for the highest achieved volume fraction φ for samples with different aspect ratio a/b. The low values for q_4 and q_6 indicate the absence of crystalline order, since e.g. FCC (face center cubic) and HCP (hexagonal close packing) structures would have high q_6 values (q_6>0.5) and a SC (simple cubic) structure would result in high q_4 values (q_4>0.7).

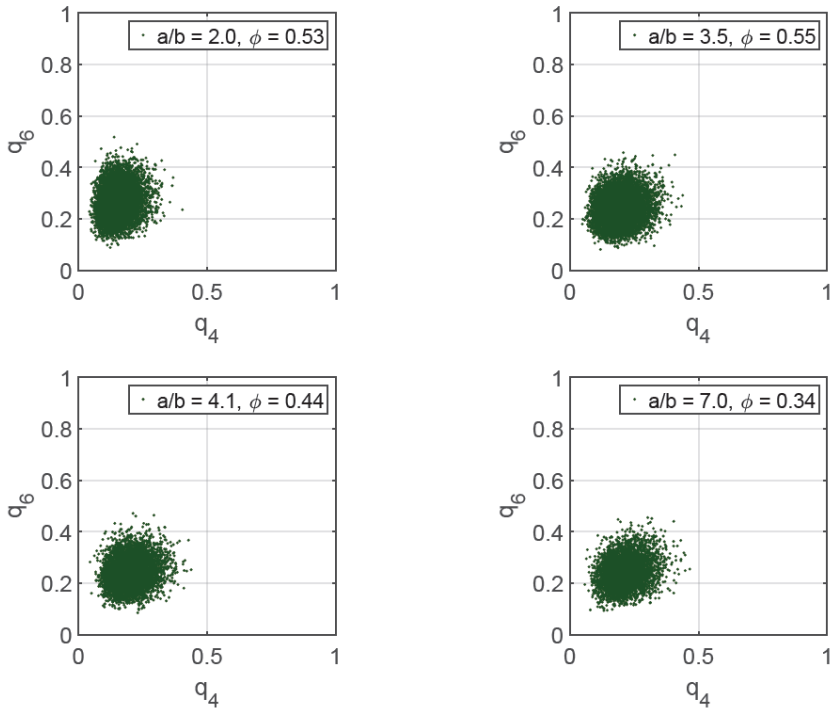

Fig. S1 Result for q4 and q6 of the bond order analysis for the densest samples of different aspect ratio a/b show the absence of crystalline order in each sample.

References

[1] P.J. Steinhardt, D.R. Nelson and M. Ronchetti, *Physical Review B*, 1983, **28**, 784-805