A single parameter description of aggregate morphologies in two-dimensions[1] TAMOGHNA DAS, MAHESH BANDI, OIST Graduate University — A morphological hierarchy of two-dimensional aggregates has been studied using molecular dynamics. Particulate aggregates resulting from the competition between short-range attraction and long-range repulsion show a transition from non-compact to compact to percolated 'gel' structures as the competition varies at a constant temperature and density. A three-dimensional (3D) parameter space controlling the competition is mapped to a single dimensionless parameter Λ. A unique relation found between the reduced second virial coefficient B_2^*, computed for a large set of points in the 3D parameter space, and Λ provides strong support for the proposed description. The observed morphologies were further quantified using an entropic measure S_2 of positional information. A simple scaling relation between S_2 and Λ shows the promise of describing the static structures of aggregates in terms of geometry alone.

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