Abstract Submitted
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Ising Lattices of Asymmetric Colloidal Dimers by Short-range Dipolar Attraction under Electric Field[1] FUDUO MA, SIJIA WANG, Colorado School of Mines, HUI ZHAO, University of Nevada, DAVID WU, NING WU, Colorado School of Mines — Colloids with anisotropic interactions could assemble into much more diversified structures than isotropic particles. Here, we investigate the impact of geometric anisotropy on the assembly of colloidal dimers on conducting substrates under applied electric fields. We have found that interactions between dimers are strongly dependent on their relative orientations. For example, when dimers stand up on the substrate, interaction is attractive between dimers with alternating orientations, while repulsive between dimers with same orientations. Such orientation-dependent interactions bring new structures, such as dimers crystals with alternating orientations. Our numerical model based on dipolar interaction agrees well with experimental results and provides further insights on electric-field assisted assembly of anisotropic particles.

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