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Surface singularities of nanorod laden droplets in magnetic field¹

KONSTANTIN KORNEV, ALEXANDER TOKAREV, Clemson University, WAHKEAT LEE, Brookhaven National Lab — Magnetic nanorods are attractive materials enabling assembly, ordering, control, and reconfiguration of different magnetic lattices within milliseconds in milliTesla magnetic fields. In this talk we will show a new physical principle of self-assembly of magnetic nanorods into singular cusps at the droplet surface. These singularities can be formed on demand not deforming the entire droplets by taking advantage of the magneto-static interactions between nanorods in non-uniform magnetic field. Using X-ray phase contrast imaging and scaling analysis we will explain the behavior of magnetic nematics and their interactions with the droplet surface.

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