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A self-consistent mean field model for hard ellipsoids

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Assemblies of hard ellipsoidal particles form orientationally ordered phases with increasing number density. A simple self-consistent mean field model is proposed to study the transition from the isotropic to the nematic phase. The simplicity of the model gives ready access to the order parameter, free energy and pressure, in good agreement with simulations. The model may be useful to describe photomechanical stresses in liquid crystal elastomers due to photoisomerization.

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