Abstract Submitted
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Non-additive simple potentials for pre-programmed self-assembly[1] CARLOS MENDOZA, IIM-UNAM — A major goal in nanoscience and nanotechnology is the self-assembly of any desired complex structure with a system of particles interacting through simple potentials. To achieve this objective, intense experimental and theoretical efforts are currently concentrated in the development of the so called "patchy" particles. Here we follow a completely different approach and introduce a very accessible model to produce a large variety of pre-programmed two-dimensional (2D) complex structures. Our model consists of a binary mixture of particles that interact through isotropic interactions that is able to self-assemble into targeted lattices by the appropriate choice of a small number of geometrical parameters and interaction strengths. We study the system using Monte Carlo computer simulations and, despite its simplicity, we are able to self assemble potentially useful structures such as chains, stripes, Kagomé, twisted Kagomé, honeycomb, square, Archimedean and quasicrystalline tilings. Our model is designed such that it may be implemented using discotic particles or, alternatively, using exclusively spherical particles interacting isotropically. Thus, it represents a promising strategy for bottom-up nano-fabrication. Reference: Daniel Salgado-Blanco and Carlos I. Mendoza, "Non-additive simple potentials for pre-programmed self-assembly", arXiv:1409.2916 [cond-mat.soft]

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