Abstract Submitted
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Hard Spheres on the Primitive Surface TOMONARI DOTERA, YUSUKE TAKAHASHI, Dept. of Physics, Kinki Univ. — Recently hierarchical structures associated with the gyroid in several soft-matter systems have been reported [1,2]. One of fundamental questions is regular arrangement or tiling on minimal surfaces [3]. We have found certain numbers of hard spheres per unit cell on the gyroid surface are entropically self-organized [4,5]. Here, new results for the primitive surface are presented. 56/64/72 per unit cell on the primitive minimal surface are entropically self-organized. Numerical evidences for the fluid-solid transition as a function of hard sphere radius are obtained in terms of the acceptance ratio of Monte Carlo moves and order parameters. These arrangements, which are the extensions of the hexagonal arrangement on a flat surface, can be viewed as hyperbolic tiling on the Poincaré disk with a negative Gaussian curvature.

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