

Abstract Submitted
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Packing of charged chains on toroidal geometries?¹ ZHENWEI YAO, MONICA OLVERA DE LA CRUZ, Northwestern University — We study sequential Langmuir adsorption of a flexible charged polyelectrolyte chain on tori. In the regime of monomer-monomer electrostatic interaction dominating over thermal fluctuations, it becomes a generalized Thomson problem. Various patterns of adsorbed chain are found including double spirals, disclination-like structures, Janus tori and uniform wrappings, arising from the long-range electrostatic interaction and the toroidal geometry. Their broken mirror symmetry and energetics are analyzed. In particular, we find a power law for the electrostatic energy; the dependence of the power on the geometry of tori implies a geometric origin. Furthermore, in the regime of large thermal fluctuation, we systematically study random walks on tori that generate chain configurations; the features associated with the toroidal geometry are discussed.

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Zhenwei Yao
Northwestern University

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