

Abstract Submitted
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Tunable order for helically confined charges PETER SCHMELCHER, ANSGAR SIEMENS, University of Hamburg
— We explore the formation of order for a system of long-range interacting particles on helices. The repulsive Coulomb interaction of equally charged particles acquires an oscillatory distance dependence when the particles are confined to a helix. This can lead to bound states and in particular to a plethora of distorted equilibrium configurations. Here we investigate the equilibria on a toroidal helix and report on a structural transition in the presence of an external electric field. While for zero field an amorphous-like particle ordering is observed the presence of a strong field leads to a crystalline order of the particles on the helix. The field allows to continuously tune between these distinct configurations. Different system sizes are explored and relevant observables are analyzed.

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