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Knotting Probability for Stretched Polygons in a Lattice Tube

The topological entanglements of polygons confined to a lattice tube and under the influence of an external tensile force f will be examined. The tube constraint allows us to prove a pattern theorem via transfer matrix arguments for any arbitrary fixed value of f . The resulting stretched polygon pattern theorem can then be used to show that the knotting probability of an n -edge stretched polygon confined to a tube goes to one exponentially as $n \rightarrow \infty$. Thus as $n \rightarrow \infty$ when polygons are influenced by a force f , no matter its strength or direction, topological entanglements, as defined by knotting, occur with high probability.

This is joint work with M. Atapour and S. G. Whittington.