Asymptotics of polygons in restricted geometries subject to a force

Nicholas Beaton[*1], Jeremy Eng[*1], and Christine Soteros[*1]

[1]Department of Mathematics and Statistics, [Regina, Saskatchewan] – Department of Mathematics
Statistics College West Building, CW307.14 University of Regina 3737 Wascana Parkway Regina,
Saskatchewan S4S 0A2 Canada, Canada

Abstract

We consider self-avoiding polygons in a restricted geometry, namely an infinite $L \times M$ tube in Z3. These polygons are subjected to a force f, parallel to the infinite axis of the tube. When $f > 0$ the force stretches the polygons, while when $f < 0$ the force is compressive. In this extended abstract we obtain and prove the asymptotic form of the free energy in the limit $f \to -\infty$. We conjecture that the $f \to -\infty$ asymptote is the same as the free energy of Hamiltonian polygons, which visit every vertex in a $L \times M \times N$ box.

[*]Speaker