[P11] Collapse transition of a lattice polymer

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We study the collapse transition of a lattice polymer with attractive interactions between monomers by calculating the exact partition function zeros. The exact partition function is obtained by enumerating the number of possible conformations for each energy value, and the exact distributions of the partition function zeros are found in the complex temperature plane by solving a polynomial equation. We observe that the locus of zeros closes in on the positive real axis as the chain length increases, providing the evidence for the onset of the collapse transition. By analyzing the scaling behavior of the first zeros with the polymer length, we estimate the transition temperature and the critical exponent.