

EXACTLY SOLVABLE DIRECTED RANDOM POLYMERS IN
1 + 1 DIMENSION

I. Corwin

Clay Mathematics Institute and MIT

Directed random polymers in 1 + 1 dimension are expected to display anomalous scalings in their endpoint and free energy. We discuss the exact solvability of three models for positive temperature directed polymers and explain how the solvability provides proof of these scalings and statistics for the free energy. These polymers are closely related to certain stochastic partial differential equations describing some randomly growing interfaces, interacting particle systems and branching random walks; as well as certain quantum many body systems like the delta Bose gas.

Keywords: directed polymers, growth processes, interacting particle systems, delta Bose Gas, stochastic PDEs