6-Vertex and O(1) Dense Loop Model: Correspondences of Razumov-Stroganov type

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Razumov and Stroganov conjectured in 2001 a correspondence between the enumerations of Fully-packed loops (FPL) on a n x n square (related to the 6-Vertex Model), refined according to the link pattern, and the ground-state components of the Hamiltonian in the periodic XXZ Quantum Spin Chain at Delta=-1/2 (related to the O(1) Dense Loop Model, DLM).

Extensions have been considered later on. In particular, Di Francesco in 2004 suggested a one-parameter generalization: on the `DLM side', the ground state of Hamiltonian H is replaced by the one of the Scattering Matrix S(t); on the `FPL side', one also considers the refinement on the last row. A rotational symmetrisation is required.

We give a new extension, relating the ground state of the scattering matrix to a different enumeration of FPL's. This in turns provides unified proofs of both the original and the generalized conjecture.

Work in collaboration with Luigi Cantini.