Height fluctuations in interacting dimers

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Perfect matchings of Z^2 (also known as non-interacting dimers on the square lattice) are an exactly solvable 2D statistical mechanics model. It is known that the associated height function behaves like a massless gaussian field, with the variance of height gradients growing logarithmically with the distance (see e.g. Kenyon, Okounkov, Sheffield '06). As soon as dimers mutually interact, the model is not solvable any more. However, tools from constructive field theory allow to prove that, as long as the interaction is small, the height field still behaves like a gaussian log-correlated field. Work in collaboration with A. Giuliani and V. Mastropietro.