

# Hypergeometric expression for the resolvent of the discrete Laplacian in low dimensions

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## Abstract

We present an explicit formula for the resolvent of the discrete Laplacian on the square lattice, and compute its asymptotic expansions around thresholds in low dimensions. As a by-product we obtain a closed formula for the fundamental solution to the discrete Laplacian. For the proofs we express the resolvent in a general dimension in terms of the Appell-Lauricella hypergeometric function of type  $C$  outside a disk encircling the spectrum. In low dimensions it reduces to a generalized hypergeometric function, for which certain transformation formulas are available for the desired expansions.

This talk is based on a joint work with Arne Jensen, Aalborg University.