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Percolation on non-planar lattices

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Percolation on non-planar lattices, such as lattices with crossing bonds, are generally expected to be in the two-dimensional universality class of ordinary percolation, and indeed that is the case for the leading behavior. However, we have found that the corrections to scaling, as characterized by the exponent Ω , are different for the non-planar system. This might imply that the usual corrections exponent is zero here due to some symmetry of the system. For a non-planar system, we consider bond percolation on the square covering lattice, which is equivalent to site percolation on the bond covering lattice. We also can consider a multilayer square lattice as an example of a non-planar system. We discuss methods to determine the threshold and the corrections exponent accurately.

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