

# Percolation on trees as a Brownian excursion: from Gaussian to Kolmogorov-Smirnov to Exponential statistics

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We calculate the distribution of the size of the percolating cluster on a tree in the subcritical, critical and supercritical phase. We do this by exploiting a mapping between continuum trees and Brownian excursions, and arrive at a diffusion equation with suitable boundary conditions. The exact solution to this equation can be conveniently represented as a characteristic function, from which the following distributions are clearly visible: Gaussian (subcritical), Kolmogorov-Smirnov (critical) and exponential (supercritical). In this way we provide an intuitive explanation for the result reported in R. Botet and M. Płoszajczak, *Phys. Rev. Lett* 95, 185702 (2005) for critical percolation.

F. Font-Clos and N. R. Moloney, *Percolation on trees as a Brownian excursion: From Gaussian to Kolmogorov-Smirnov to exponential statistics*, *Phys. Rev. E* **94**, 030102(R) (2016).