

# Subcritical annulus crossing in spatial random graphs

Prof. Dr. Benedikt Jahnel

(Technical University of Braunschweig)

December 04, 2024

In this talk, we consider general continuum percolation models obeying sparseness, translation invariance, and spatial mixing. In particular, this includes models constructed on general point sets other than the standard Poisson point process or the Bernoulli-percolated lattice. Moreover, in our setting the existence of an edge may depend not only on the two end vertices but also on a surrounding vertex set and models are included that are not monotone in some of their parameters. For such model we present a key criterion of no long edges to guarantee that the critical annulus-crossing intensity is positive. This implies in particular existence of subcritical percolation phases and convergence rates for subcritical cluster sizes. We apply our results to several models from the literature such as general weight-dependent random connection models and random graphs based on correlated point processes.