Kilian Matzke

Triangle Condition for the Critical Random Connection Model in High Dimensions via Lace Expansion

Joint with Markus Heydenreich, Remco van der Hofstad and Günter Last

The random connection model is a random graph whose vertices are given by the points of a Poisson process and whose edges are obtained by randomly connecting pairs of Poisson points in a position dependent but independent way. Under very general conditions, the resulting random graph undergoes a percolation phase transition if the the Poisson density varies, and we are interested in the case of critical percolation. Our main result is an infrared bound for the critical connectivity function if the dimension is sufficiently large or if the pair connection function has sufficient slow decay. This is achieved through an adaptation of the percolation lace expansion for Poisson processes.