

Intensity of a Gibbs point process and an abstract inversion theorem

Sabine Jansen

(LMU Munich)

The intensity of a Gibbs point process (density) is a highly non-trivial function of the intensity of the underlying Poisson point process (activity). In statistical physics it is often of interest to compute not only this relation but also its inverse relation. The talk presents an abstract inversion theorem on mappings between spaces of measures and explains how it applies to the intensity of a Gibbs point process when the overall intensity is small. The inversion theorem applies even when the conditions of a Banach inversion theorem are not met and allows one to bypass more complicated setups such as Nash–Moser. A crucial role is played by trees and their recursive structure. There are some relations with the Poisson saddlepoint approximation by Baddeley and Nair (2012) and applications of the virial expansion by Ogata and Tanemura (1984).

Based on joint work with Tobias Kuna and Dimitrios Tsagkarogiannis (arXiv: 1906.02322 [math-ph]).