

概率论系列报告

报告题目 (Title): A characterization of L^2 mixing and hypercontractivity via hitting times and maximal inequalities

报告人 (Speaker): Dr. Jonathan Hermon,
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时间 (Time): 9月4日(周一)下午 2:00-3:00

地点 (Venue): 北京大学理科一号楼 1303

摘要 (Abstract): (joint work with Yuval Peres): There are several works characterizing the total-variation mixing time of a reversible Markov chain in terms of natural probabilistic concepts such as stopping times and hitting times. In contrast, there is no known analog for the uniform (L_{∞}) mixing time (UMT), (there is neither a sharp bound nor one possessing a probabilistic interpretation). We show that the UMT can be characterized up to a constant factor using hitting times distributions. We also derive a new extremal characterization of the Log-Sobolev constant, ρ_{LS} , as a weighted version of the spectral gap. This characterization yields a probabilistic interpretation of ρ_{LS} in terms of a hitting time version of hypercontractivity. As applications, we (1) resolve a conjecture of Kozma by showing that the UMT is not robust under rough isometries (even in the bounded degree, unweighted setup), (2) show that for weighted nearest neighbor random walks on trees, the UMT is robust under bounded perturbations of the edge weights, and (3) Establish a general robustness result under addition of weighted self-loops.

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