

Parabolic theory of the adjacency matrix

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Abstract. We review different continuous dynamical systems on graphs. There is a large literature on heat-like equations driven by the discrete Laplacian on finite and infinite graphs; in my talk, I am rather going to focus on the adjacency matrix and study forward and backward well-posedness of the associated dynamical systems, along with qualitative properties that include Markovian-type behavior and long-time asymptotics. The case of infinite graphs is of particular interest: I will make a point that line graphs are a particularly benign environment to study the relevant evolution equation; this is in sharp contrast to the fact that such an equation is ill-posed on general graphs as simple as a star on infinitely many edges.

Mathematical Physics Seminar

25.10.2018, 13:30

1090 Wien, Oskar-Morgenstern-Platz 1, Besprechungszimmer 2nd Floor