

Many-particle systems on quantum graphs with singular interactions

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Single quantum particles on graphs have proven to provide interesting models of complex quantum systems; their spectral properties have been studied in great detail. In this talk we discuss extensions to quantum many-particle systems on graphs with singular interactions. We focus on two-particle interactions that are either localised at the vertices, or are of Dirac-delta type on the edges. In both cases the interactions are realised in terms of self-adjoint extensions of suitable Laplacians in two variables. These extensions can be characterised in terms of boundary conditions, and given particular boundary conditions the type of interactions can be identified. (This talk is based on joint work with Joachim Kerner.)