SFB/TRR 21 - Seminar

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Multi-level, multi-photon processes: A hierarchy of approximations

Multi-level, multi-photon processes occur in many atom-photon experiments. Usually, only a few of the atomic levels are near-resonant and critical for the interaction - the relevant levels - while the remaining levels provide indirect coupling routes but are hardly populated. The goal of any analytical approach to describing such processes is to reduce the dimensionality of the system by focusing only on the relevant levels. The standard approximation carries the name of ädiabatic elimination", which is a simple procedure to eliminate irrelevant levels, but provides no clues to how one might incorporate higher-order corrections. In this talk, I present two approaches to a systematic hierarchy of approximations and discuss how they "correctädiabatic elimination, without much increase in complexity.

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