

Quasi-Steady State and Singular Perturbation Theory

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The quasi-steady state hypothesis is frequently applied in the analysis of reaction equations in chemistry and biochemistry, and usually leads to a heuristic method to reduce the dimension of a problem, with little if any attempt of mathematical justification. It turns out that taking a more rigorous mathematical approach to the problem (based on Tikhonov's and Fenichel's work) not only sets the approach on solid ground and allows convergence proofs, but also allows a simpler computation of reduced equations. (The talk is based on the doctoral thesis of Lena Noethen at RWTH Aachen, and subsequent publications.)