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The Quasi-steady state hypothesis for stochastic models of enzyme kinetics

In a stochastic version of the Briggs-Haldane equations, we show that the classical quasi-steady state hypothesis corresponds to a averaging principle or local ergodic theorem for the fast enzymatic reaction. This way, we obtain a more natural explanation of the Michaelis Menten kinetics on the slow time scale. Some more detailed estimates are presented, too.