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Monomolecular reaction networks: flux-influenced sets and balloons

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In the case of monomolecular reaction networks, we study the network response to perturbations of a reaction rate j^* . Following Fiedler and Mochizuki, we describe which other reaction rates j' respond with nonzero reaction flux, at steady state. Nonzero responses of j' to j^* are called flux-influence of j^* on j' . We give a structural description of the flux-influenced sets. We show a crucial property of them: if j^* flux-influences j' , then the set flux-influenced by j' is contained in the one flux-influenced by j^* . Finally we derive some consequences important for chemical applications.

This is a joint work in progress with Hiroshi Matano.