Controlling stochastic non – linear systems: "universal" strategies.[1] GIUSEPPE FORTE, DERVIS CAN VURAL, Univ of Notre Dame — Reaction networks describe a broad range of physical, chemical, biological, ecological and social phenomena. Reactions are defined in terms of a set of rules that define what species turn into what others upon collision, and are well approximated by coupled Langevin equations in the high-concentration limit. In this work, we focus on the control of stochastic reaction networks of the Langevin type. We derive an exact formula that allows us controlling a generic stochastic system subject to generic cost functionals, and illustrate our formula with special cases. Perhaps more interestingly than our general result, we find that under certain limits, the optimal protocol assumes a "universal" form, i. e. it does not depend explicitly on the details of the cost functional.

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