

Abstract Submitted
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Noise-controlled chemical fluxes and pathways¹ JEAN-SEBASTIEN GAGNON, Harvard University, DAVID HOCHBERG, Department of Molecular Evolution, Centro de Astrobiología (CSIC-INTA), JUAN PEREZ-MERCADER, Harvard University — We investigate the effect of externally tunable noise on the behavior of a simple chemical reaction network model. By combining powerful techniques from the renormalization group and from stoichiometric network analysis, we show that the renormalization of chemical parameters (such as decay and reaction rates) induces a renormalization of extreme chemical fluxes and stationary concentrations. This method thus provides the means to explore the impact that noise has on the chemical fluxes and pathways directly, thus demonstrating how externally tunable noise may be used to control, promote and optimize chemical progress through a given pathway.

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