Review of: "Reaction rate view on autocatalysis"

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This article points to the interesting aspect that several properties of reaction networks calculated at the topological or stoichiometric levels (such as autocatalysis, and other properties regarding stability), are in reality only local in time, and highly dependent on the actual dynamics that is ruling the system.

I suggest the author elaborates a bit more on the “mapping” between states and fluxes that is induced by a kinetic. This map (in the deterministic case) assigns a flux to each state, but such flux in turn updates the state (differential dynamical step at the state domain), which in turn updates the flux (differential step at the flux domain), and so on...Hence, there are “regions” of states (which in turn induce regions of fluxes), where a given “local” phenomena such as autocatalysis is observed as an invariant. Of course the topological and stoichiometric criteria preceeds the existence of such regions, but once these criteria are met the question becomes identifying the "regions of feasibility" of the property in question.

I recommend taking a look to an article where the feasibility question was studied for the case of self-maintainance:

Peter, S., Veloz, T., & Dittrich, P. (2010, August). Feasibility of organizations–a refinement of chemical organization theory with application to P systems. In *International Conference on Membrane Computing* (pp. 325-337). Springer, Berlin, Heidelberg.

The results in this article could perhaps help to advance on the idea for autocatalysis.

I completely agree in that this “map-like” perspective is new in biochemistry so this piece of text is very valuable. Interestingly, such idea has been explored to some extent in the context of Petri Nets, defining the concepts of reachability and covereability (which are even older and come from Vector Addition Systems, a mathematically equivalent formalism with Petri Nets, and with Reaction Networks), but there is still a lot to do in this topic!