Methods for Domain Preservation
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Many stochastic (partial) differential equations that arise, for example in mathematical biology preserve a particular doamin. There are often physical/biological constraints for this such as concentrations should be positive or solutions should lie in a certain domain (eg [0,1] for stochastic gating variables). The question then arises how to preserve these domains in a numerical simulation. We develop a numerical method based on exponential integrators that naturally preserve such domains and discuss convergence and efficiency. This work is joint with Utku Erdogan.

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