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Stochastic semigroups and their applications to Stein's neural model

We start with some results concerning asymptotic decomposition of substochastic operators and semigroups [1, 2] Then we present corollaries useful in studying of piecewise deterministic Markov processes [4]. We recall Stein's description of activity of neuronal cells and we take notice of problems which appear in its formulation in terms of stochastic semigroups. Finally, we apply results concerning stochastic semigroups to this model [3].

References

- [1] K. Pichór and R. Rudnicki, *Asymptotic decomposition of substochastic operators and semigroups*, J. Math. Anal. Appl. **436** (2016), 305–321.
- [2] ———, *Asymptotic decomposition of substochastic semigroups and applications*, Stochastics and Dynamics **18** (2018), 1850001–18.
- [3] ———, *Stability of stochastic semigroups and applications to stein's neuronal model*, Discrete Contin. Dyn. Syst. B **23** (2018), 377–385.
- [4] R. Rudnicki and M. Tyran-Kamińska, *Piecewise deterministic processes in biological models*, SpringerBriefs in Mathematical Methods, Springer, Cham, Switzerland, 2017.