



A generator theorem with applications to queueing systems

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Abstract

In the existing literature there are many articles investigating various different queueing systems modeled by partial differential equations. Most of these articles study these systems and the asymptotic behaviour of their solutions in the context of semigroup theory. The state spaces of these problems are usually products of L^1 -spaces over different measure spaces.

A major point in all those investigations is the proof that the solution to the given queueing system is given by a (sub-)stochastic semigroup. Recently, Tyran-Kamińska and Gwiżdż proved a generator theorem that extended an abstract theorem of Greiner to the case of unbounded boundary conditions. We give a new simplified proof of the theorem in the context of AL-spaces and apply it to several different examples from the existing literature.

Finally, we show that the asymptotic behaviour of the solution semigroups can be investigated by using tools from Perron-Frobenius theory only and without the use of the ABLV-theorem.

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