



Positive Miyadera–Voigt perturbations of bi-continuous semigroups Christian Budde¹

We discuss positive Miyadera–Voigt type perturbations for bi-continuous semigroups on AL-spaces with an additional locally convex topology generated by additive seminorms. The main example of such spaces is the space of bounded Borel measures (on a Polish space).

Markov processes associated to stochastic differential equations or jointly continuous flows on metric spaces give rise to semigroups which are in general not strongly continuous with respect to the Banach space norm but they do enjoy strong continuity with respect to a weaker additional locally convex topology on the Banach space. An auspicious approach to such operator semigroups has been introduced by F.Kühnemund [9, 8] by means of bi-continuous semigroups. The theory of such semigroups has recently attract attention [7, 3, 5, 1] and especially perturbation theory of bi-continuous semigroups [4, 6].

Various models of physical processes ask for positive solutions in order to have a reasonable interpretation, e.g., consider solutions containing the absolute temperature or a density. The maximum principle for elliptic and parabolic partial differential equations guarantees positive solutions under positive initial data. This demonstrates the importance of positivity in the theory of operator semigroups on Banach lattices, hence in the theory of linear evolution equations.

This talk is based on [2] and generalizes the perturbation result of Voigt [10] to the class of bi-continuous semigroups.

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