UNIFORMLY γ-RADONIFYING FAMILIES OF OPERATORS

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Abstract

In this joint work with Jan van Neerven we introduce the notion of uniform γ-radonification of a family of operators, which unifies the notions of R-boundedness of a family of operators and γ-radonification of an individual operator. We study the the properties of uniformly γ-radonifying families of operators in detail and apply our results to the stochastic abstract Cauchy problem

$$dU(t) = AU(t)dt + BdW(t), U(0) = 0.$$

Here, A is the generator of a strongly continuous semigroup of operators on a Banach space E, B is a bounded linear operator from a separable Hilbert space H into E, and W is an H-cylindrical Brownian motion. For diagonal operators A and bounded operators B which are "not too far" from being simultaneously diagonal with A we prove that an invariant measure exists if and only if the family

$$\{\lambda^{(1/2)} R(\lambda, A)B : \lambda > 0\}$$

is uniformly γ-radonifying. This result can be viewed as a partial solution of a stochastic version of the famous Weiss conjecture in linear systems theory.