Regularity and large-time behaviour of linear SPDEs driven by Volterra processes

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In the first part, stochastic convolution integrals driven by cylindrical (not necessarily Gaussian) Volterra processes are studied. Examples of such processes are fractional and multifractional Brownian motion (in the Gaussian case) or the Rosenblatt process (in the non-Gaussian case). The standard regularity result based on the factorization method is used to show its space-time regularity. Since the general Hilbert-space approach is not quite satisfactory especially in the non-Gaussian case it is extended to the state space L^p. The main tool used is a hypercontractivity result on Banach-space valued random variables in a finite Wiener chaos. In particular, this part is applicable to stochastic heat equation with pointwise or distributed Rosenblatt noise. In the second part, large-time behaviour of solutions to stochastic evolution equations driven by two-sided regular cylindrical Volterra processes is studied. The driving process is assumed to have stationary and reflexive increments. Conditions for the existence of limiting measure and existence of a strictly stationary solution are found. These results are applicable, for example, to the heat equation perturbed by the Rosenblatt process. The talk is based on joint works with Petr Coupek and Martin Ondrej.