Rajeev B. (Indian Statistical Institute, Bangalore Centre, India) and **Tappe S.** (University of Freiburg, Germany) — **Invariant manifolds in scalings of Hilbert spaces.**

In the paper [3] a connection between finite dimensional stochastic differential equations (SDEs) and particular types of stochastic partial differential equations (SPDEs) has been established. The goal of this presentation is to generalize this connection to a broader class of SPDEs. For this issue, let G and H be two separable Hilbert spaces such that $G \subset H$ and $\tau_H \cap G \subset \tau_G$; that is, G is included in H as a set, whereas the topology of G is finer than that of H. We consider the SPDE

$$\begin{cases} dY_t &= L(Y_t)dt + A(Y_t) \cdot dW_t \\ Y_0 &= y_0 \end{cases}$$

with a $\mathbb{R}^r$-valued standard Wiener process W for some $r \in \mathbb{N}$, and (τ_G, τ_H)-continuous mappings $L : G \to H$ and $A^j : G \to H$ for $j = 1, \ldots, r$. Let $\mathcal{M}$ be a finite dimensional C^2-submanifold of H with topology induced by τ_G. We provide necessary and sufficient conditions for invariance of the manifold $\mathcal{M}$ in terms of the coefficients L and A. For the particular case of quasi-linear coefficients, our framework covers that considered in [3], which constitutes a generalization. Furthermore, our framework also covers semilinear SPDEs in the spirit of the semigroup approach as presented in [1], and we will derive a generalization of the invariance result from [2]. We emphasize that our approach does not require smoothness of the volatilities.

REFERENCES

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