Weighted Energy–Dissipation principle for nonlinear stochastic evolution equations

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We present the Weighted Energy–Dissipation (WED) principle for nonlinear stochastic evolution equations in variational form. The approach consists in minimizing suitable convex WED functionals, defined on spaces of entire trajectories, and depending on an approximation parameter. The corresponding Euler–Lagrange equation is characterized as an elliptic-in-time regularization of the original problem, which can be equivalently seen as a forward–backward nonlinear stochastic evolution system. Finally, WED minimizers are shown to converge to the solution of the original nonlinear evolution equation as the approximation parameter vanishes.

This study is based on a joint work with Ulisse Stefanelli (University of Vienna, Austria).