Regularization by noise of semilinear stochastic damped wave equations with Hölder continuous coefficients

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We prove that semilinear stochastic abstract wave equations and damped wave equations are well-posed in the strong sense with an α-Hölder continuous drift coefficient, if $\alpha \in (2/3, 1)$.

The uniqueness may fail for the corresponding deterministic PDE and well-posedness is restored by considering an additive pertubation of white noise type which describes an external random forcing. This shows that a kind of regularization by noise holds for the semilinear wave equation.

In the proof we adopt an approach based on backward stochastic equations and use non-standard regularizing properties for the transition semigroup associated to the stochastic wave equation; these properties are based on control theoretic results.

We finally briefly discuss how our method applies also to stochastic evolution of parabolic type

The talk is based on joint works with D. Addona and E. Priola