The BDF2-Maruyama Method for Stochastic Evolution Equations with Monotone Non-Lipschitz Drift

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We investigate the numerical approximation of stochastic evolution equations whose drift operators satisfy a monotonicity condition and are locally Lipschitz continuous. For the underlying numerical method, we utilize the two-step backward difference formula (BDF2) for the time discretization in conjunction with an abstract Galerkin scheme.

In the talk, we establish for the BDF2-Maruyama method a rate of convergence in the strong sense by using the variational approach. The error analysis is based on the concept of p-variation to measure the temporal regularity of the analytical solution. To illustrate our result, we discuss how the stochastic Allen–Cahn equation fits into our framework.

This is joint work with Raphael Kruse (MLU Halle–Wittenberg).