Delay dependent stability analysis of S-ROCK method

Alexey Eremin (Saint-Petersburg State University)

The talk is concerned with the numerical solution of stochastic delay differential equations. Stochastic Runge–Kutta–Chebyshev methods (S-ROCKs) are considered. Their delay-dependent stability for a linear scalar test equation with real coefficients is studied. With help of the so-called root locus technique, the full asymptotic stability region in mean square is obtained, which is characterized by a sufficient and necessary condition in terms of the drift and diffusion coefficients as well as time stepsize and the damping parameter eta. The derived condition is compared with the analytical stability condition.