

Uncertainty Quantification for Kinetic and Hyperbolic Equations with Diffusive Scalings

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In this talk we will study generalized polynomial chaos (gPC) approach to transport equation with uncertain cross-sections and show that they can be made asymptotic-preserving, in the sense that in the diffusion limit the gPC scheme for the transport equation approaches to the gPC scheme for the diffusion equation with random diffusion coefficient. This allows the implementation of the gPC method without numerically resolving (by space, time, and gPC modes) the small mean free path for transport equation in the diffusive regime.