



Seminar/Talk

Universality of affine and polynomial processes

Christa Cuchiero

Uni Wien

Host: M. Beiglböck, N. Berestycki, L. Erdős, J. Maas, F. Toninelli

We elaborate on universal properties of affine and polynomial processes. In several recent works we could show that many models which are at first sight not recognized as affine or polynomial can nevertheless be embedded in this framework via infinite dimensional lifts. For instance, essentially all examples of (rough) stochastic volatility models in mathematical finance can be viewed as infinite dimensional affine or polynomial processes. Moreover, all well-known measure-valued diffusions in population genetics such as the Fleming–Viot process, the Super–Brownian motion, and the Dawson–Watanabe superprocess are affine or polynomial. This suggests an inherent universality of these model classes. We try to make this mathematically precise by showing that generic classes of diffusion models are projections of infinite dimensional affine processes (which in this setup coincide with polynomial processes). A key ingredient to establish this result is the signature process, well known from rough paths theory. This then allows to get (formal) power series expansions for the Laplace transform/characteristic function of large classes of stochastic processes via duality methods, which are well known from classical (finite dimensional) affine and polynomial processes. The talk is based on joint works with Sara Svaluto-Ferro and Josef Teichmann.

Tuesday, November 10, 2020 05:30pm - 06:15pm

Online via Zoom



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