

Hairer’s multilevel Schauder estimates without regularity structures

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The formalism of regularity structures was developed around ten years ago by Martin Hairer in order to give well-posedness results for singular stochastic partial differential equations. In recent years, there has been an effort to try and isolate the main results of this framework, in order to state (and prove) them as “standalone” results in distribution theory. At the center of this programme lies the notion of a germ: a germ is simply a family of distributions indexed by points in \mathbb{R}^d . We usually think of it as a collection of local approximations to a distribution of interest.

In this presentation, I will try to motivate why germs naturally appear in this context, introduce the key notions of coherence and homogeneity, then discuss two important results: the reconstruction theorem, and Schauder estimates for germs. Together, they essentially power the analytic part of the theory of regularity structures.

Based on joint work with Francesco Caravenna and Lorenzo Zambotti.