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Schauder Estimates and a Diagram-Free Approach to Regularity Structures

In this talk, I will present a diagram-free approach to the theory of regularity structures. In particular, our method can be applied to show a priori estimates in Hölder spaces for renormalized, classically ill-defined quasilinear SPDEs in the subcritical regime. We first discuss a novel and efficient method to obtain (linear) Schauder estimates for germs which correspond to solutions of elliptic equations in anisotropic settings. The notion of a germ in regularity structures is a generalization of the standard Taylor polynomials. This method does not use kernel estimates, but is based on a scaling argument originally introduced by Simon in the classical case. I will then show how these linear estimates can be applied to derive estimates for the nonlinear problem via our diagram-free approach.

The talk is based on joint work with Scott Smith, and on joint work with Felix Otto, Scott Smith, and Hendrik Weber.