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Besov regularity of solutions to PDEs: An overview

In this talk, we will be concerned with the regularity of the solutions to partial differential equations. In particular, we are interested in smoothness estimates in the specific scale $B_{\tau}^{\alpha}(L_{\tau})$, $1/\tau = \alpha/d + 1/p$, of Besov spaces which determines the approximation order of adaptive and other nonlinear numerical approximation schemes. We will discuss various results which show that in many cases the Besov regularity of the solutions to PDEs is high enough to justify the use of adaptive schemes. In particular, recent results for nonlinear elliptic partial differential equations and for stochastic evolution equations will be highlighted.