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June 2, 4:30–4:55pm

Optimal Function Spaces for Continuity of the Hessian Determinant as a Distribution.

In this talk we describe a new class of optimal continuity results for the action of the Hessian determinant on spaces of Besov type into the space of distributions on \mathbb{R}^N . In particular, inspired by recent work of Brezis and Nguyen on the distributional Jacobian determinant, we show that the action is continuous on the Besov space of fractional order $B(2 - \frac{2}{N}, N)$, and that all continuity results in this scale of Besov spaces are consequences of this result. A key ingredient in the argument is the characterization of $B(2 - \frac{2}{N}, N)$ as the space of traces of functions in the Sobolev space $W^{2,N}(\mathbb{R}^{N+2})$ on the subspace \mathbb{R}^N of codimension 2. The most delicate and elaborate part of the analysis is the construction of a counterexample to continuity in $B(2 - \frac{2}{N}, p)$ with $p > N$. This is joint work with D. Jerison.