Geometric rigidity of tangent symmetric gradient measures

Adolfo Arroyo Rabasa (University of Warwick)

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Abstract

The space of functions of bounded deformation $BD(\Omega)$ consists of all vector-valued maps $u : \Omega \subset \mathbb{R}^n \to \mathbb{R}^n$ such that their (distributional) symmetric gradient can be repesented by a Radon measure with values on the space of symmetric $n \times n$ matrices, that is,

$$Eu = Du + (Du)^t \in \mathcal{M}(\Omega; M^{sym}_{n\times n}).$$

During the talk I will give a simple yet full characterization of all functions of bounded deformation which satisfy a one-dimensional differential inclusion of the form

$$Eu(x) \in \{tP : t \in \mathbb{R}\} \quad \forall\, x \in \Omega, P \in M^{sym}_{n\times n}.$$

I will also discuss applications of this result in linear elasticity models and other structural measure/geometric properties of symmetric gradients.