Measure-valued structured deformations

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Structured deformations were introduced by Del Piero and Owen as a model for deformations of solids exhibiting additional submacroscopic disarrangements like microscopically grained slips. Macroscopically, they are described by a deformation map which is piecewise differentiable with possible jumps (or, more generally, of class SBV), together with an additional internal variable in L^1 which can be used to keep track of submacroscopic disarrangements. We discuss the natural (weak*) closure of this class in $BV \times \mathcal{M}$ (functions of bounded variation and measures) and the relaxation of associated variational problems, extending earlier results of Choksi and Fonseca.

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