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Partial Regularity for Minimizers of Degenerate Polyconvex Energies

We prove partial regularity of minimizers for a class of polyconvex integral functionals

$$\int_\Omega f(Du, \operatorname{Ad} Du, \det Du)\, dx,$$

where f is degenerate convex. Our class includes the model case

$$\int_\Omega (|Du|^p + |\operatorname{Ad} Du|^p + |\det Du|^p)\, dx.$$

The method of proof involves a blow-up technique combined with a suitable asymptotic analysis of the degeneration nature of the first term $\int_\Omega |Du|^p\, dx$.

Keywords: Polyconvexity, regularity, elliptic systems.

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