1020-35-104   **Sungwon Cho** and **Xiaodong Yan*** (`xiayan@math.msu.edu`), Department of Mathematics, Michigan State University, East Lansing, MI 48824. *Singular set for Lipschitzian critical points of polyconvex functionals from nonlinear elasticity.*

Partial regularity is proved for Lipschitzian critical points of polyconvex functionals motivated by nonlinear elasticity provided $\|Du\|_{L^\infty}$ is small enough. In particular, the singular set for a Lipschitzian critical point has Haudorff dimension strictly less than n when $\|Du\|_{L^\infty}$ is small enough. Model problems treated include

$$\int_\Omega |\nabla u|^2 + |\det \nabla u|^2$$

where $u : \Omega \, (\subset \mathbb{R}^2) \longrightarrow \mathbb{R}^2$, and

$$\int_\Omega |\nabla u|^2 + |\nabla u|^s + |\mathrm{Adj}\nabla u|^s + |\det \nabla u|^s$$

where $u : \Omega \, (\subset \mathbb{R}^3) \longrightarrow \mathbb{R}^3$ with $s \geq 2$.

Moreover, it is shown that the singular set of a Lipschitzian global minimizer has Hausdorff dimension strictly less than n. (Received August 20, 2006)

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