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Xiaodong Yan* (xiayan@math.msu.edu), Department of Mathematics, Michigan State University, East Lansing, MI 48824. *Maximal smoothness for solutions to equilibrium equations from 2D nonlinear elasticity.*

For a class of variation integrals from 2D nonlinear elasticity, we prove any $W^{2,2} \cap C^1$ weak solution for the equilibrium equations is smooth. Moreover, we present an example showing the assumption $u \in W^{2,2}$ is optimal. (Received February 27, 2006)