

TEMPLE UNIVERSITY

Department of Mathematics

Applied Mathematics and Scientific Computing Seminar

Room 617 Wachman Hall

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Higher regularity of C^1 weak local minimizers

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Let Ω be an open, smooth and bounded domain in \mathbb{R}^d and the Lagrangian $W : \overline{\Omega} \times \mathbb{R}^{m \times d} \rightarrow \mathbb{R}$ be a smooth function. We will discuss the notion of weak local minimizers for the functional

$$E(\mathbf{y}) = \int_{\Omega} W(\mathbf{x}, \nabla \mathbf{y}(\mathbf{x})) d\mathbf{x}.$$

We show that if \mathbf{y} solves Euler-Lagrange equation, the second variation is uniformly positive definite and \mathbf{y} is of class C^1 , then \mathbf{y} must necessarily be of class $W_{loc}^{2,2}$.