

M. Bildhauer, M. Fuchs

On the regularity of local minimizers of decomposable variational integrals on domains in \mathbb{R}^2

Comment.Math.Univ.Carolin. 48,2 (2007) 321-341.

Abstract: We consider local minimizers $u : \mathbb{R}^2 \supset \Omega \rightarrow \mathbb{R}^N$ of variational integrals like $\int_{\Omega} [(1 + |\partial_1 u|^2)^{p/2} + (1 + |\partial_2 u|^2)^{q/2}] dx$ or its degenerate variant $\int_{\Omega} [|\partial_1 u|^p + |\partial_2 u|^q] dx$ with exponents $2 \leq p < q < \infty$ which do not fall completely in the category studied in Bildhauer M., Fuchs M., Calc. Var. 16 (2003), 177–186. We prove interior $C^{1,\alpha}$ - respectively C^1 -regularity of u under the condition that $q < 2p$. For decomposable variational integrals of arbitrary order a similar result is established by the way extending the work Bildhauer M., Fuchs M., Ann. Acad. Sci. Fenn. Math. 31 (2006), 349–362.

Keywords: non-standard growth, vector case, local minimizers, interior regularity, problems of higher order

AMS Subject Classification: 49N60, 35J50, 35J35