# Some regularity results for integral functionals with variable growth conditions

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We deal with the regularity properties of local minimizers of integral functionals of the type

$$\mathcal{F}(u;\Omega) := \int_\Omega F(x, Du(x))\, dx$$

where the integrand $F$ is convex and satisfies the following so-called $p(x)$-growth conditions

$$|\xi|^{p(x)} \leq F(x,\xi) \leq C(1 + |\xi|^{p(x)})$$

for an exponent function $p(\cdot)$ belonging to a suitable Orlicz-Sobolev class. More precisely, we show an higher differentiability result for the minimizers and a dimension free higher integrability result for their gradients which have been object of a recent paper in collaboration with Antonia Passarelli di Napoli ([1]). Moreover, we discuss about a $C^{1,\alpha}$-partial regularity result for the local minimizers of functionals of the form

$$\mathcal{E}(u;\Omega) := \int_\Omega (1 + |Du|^2)^{\frac{p(x)}{2}}\, dx,$$

$p(\cdot) \geq 2$, which has been recently established ([2]).

### References:

[1] F.Giannetti-A.Passarelli di Napoli: Higher differentiability of minimizers of variational integrals with variable exponents, *Math. Zeit.*, 280,3 (2015), 873–892.

[2] F.Giannetti: A $C^{1,\alpha}$ partial regularity result for integral functionals with $p(x)$-growth condition, *Adv. Calc.Var.*(to appear).