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Title: **Regularity for non-homogeneous systems**

Abstract: My starting point is the analysis of the behavior of manifold-constrained minima to certain non-homogeneous functionals: under sharp assumptions, we prove that they are regular everywhere, except on a negligible, "singular" set of points, [1, 2, 4]. The presence of the singular set is in general unavoidable. Looking at minima as solutions to the associated Euler-Lagrange system does not help: it presents an additional component generated by the curvature of the manifold having critical growth in the gradient variable. It is then natural to consider general systems of type

$$-\operatorname{div}\ a(x, Du) = f \tag{0.1}$$

and study how the features of f and of the partial map $x \mapsto a(x, z)$ influence the regularity of solutions. In this respect, I am able to cover non-linear tensors with exponential type growth conditions as well as with unbalanced polynomial growth: I prove everywhere Lipschitz regularity for vector-valued solutions to (0.1) under optimal assumptions on forcing term and space-depending coefficients, [3]. This approach also yields optimal regularity results for obstacle problems.

References

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