

ANISOTROPIC DOUBLE PHASE PROBLEMS WITH MIXED REGIME

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The mathematical theory of double phase problems started with the seminal contributions of Paolo Marcellini and Giuseppe Mingione, who obtained several pioneering regularity results in the case of unbalanced variational integrals with constant exponents. This talk is devoted to several classes of PDEs with *variable exponents*, which generate *anisotropic double phase functionals*. Due to the structure of these problems, they can allow a mixed “*subcritical-critical-supercritical*” regime.

I shall consider three distinct situations corresponding to the radial, non-radial and singular settings and I shall describe sufficient conditions for the existence of solutions in suitable function spaces. Part of the central argument is based on the Palais principle of symmetric criticality, combined with topological and variational methods. The content of this talk is aimed to open larger perspectives to the understanding of nonlinear elliptic equations with *lack of compactness* and *mixed regime*.

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