

Two striking results in the study of double phase problems

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This talk is devoted to the analysis of two classes of nonlinear elliptic problems with double phase. We first consider the isotropic case and we study a quasilinear perturbation of the classical eigenvalue problem. In this new abstract setting with unbalanced growth, we establish a curious discontinuity property of the spectrum. Next, we consider the anisotropic case with double phase and we establish several existence properties for problems with mixed subcritical-critical-supercritical regime. Some open problems and perspectives will be presented in the final part of this talk.

References

- [1] C. Alves, V.D. Radulescu, *The Lane-Emden equation with variable double-phase and multiple regime*, Proc. Amer. Math. Soc. 148 (2020), 2937-2952.
- [2] N. Papageorgiou, V.D. Radulescu, D. Repovš, *Double-phase problems and a discontinuity property of the spectrum*, Proc. Amer. Math. Soc. 147 (2019), 2899-2910.