Nonstandard phenomena in the study of double-phase problems

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Abstract

We study some nonstandard phenomena associated with the analysis of two classes of stationary double-phase problems. We first discuss a striking discontinuity property of the spectrum in the isotropic case. Next, we consider the anisotropic case associated with the presence of several variable exponents. In this abstract setting, we study a class of problems with mixed "subcritical-critical-supercritical" regime and we establish sufficient conditions for the existence of solutions in the radial, nonradial and singular cases. Several perspectives are developed in the final part of this talk.