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Multiple effects in the study of singular elliptic problems

Abstract. We are mainly concerned with the following nonlinear problems:
(i) blow-up boundary solutions of the logistic equation;
(ii) Lane-Emden-Fowler type equations with singular nonlinearity and convection term.
We study the strong relationship between these nonlinear problems and we establish several qualitative results related to the existence and uniqueness of solutions, or their asymptotic behaviour. We are also concerned with various bifurcation problems associated to some classes of singular elliptic problems. The main arguments in the proofs rely on the maximum principle.

Main reference:
M. Ghergu and V. Radulescu, *Singular Elliptic Problems. Bifurcation and Asymptotic Analysis*, Oxford Lecture Series in Mathematics and Its Applications, vol. 37, Oxford University Press, 320 pp., 2008.