A priori bounds and multiple solutions for superlinear indefinite elliptic problems*

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We study existence and multiplicity questions for positive solutions of second order semilinear elliptic boundary value problems, where the nonlinearity is multiplied by a weight function which is allowed to change sign and vanish on sets of positive measure. We do not imposse a variational structure so that techniques from the calculus of variations are not applicable. Under various qualitative assumptions on the nonlinearity we stablish a priori bounds and use bifurcation and fixed point theory to prove existence and multiplicity results for positive solutions. To get the a priori bounds we use two types of techniques. First, standard blowing up arguments together with nonlinear Liouville type theorems. Then, Harnack inequality combined with interior L^p-estimates under minimal smoothness assumptions on the coefficients of the differential operator.

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