

SHARP CONSTANT-FREE A POSTERIORI ERROR BOUNDS FOR OBSTACLE PROBLEMS

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The presence of obstacles in a boundary value problem entails a nonlinear dependence of the solution on the problem data. We review the main features of this dependence and discuss the ensuing difficulties for a posteriori error estimation. We derive a posteriori upper bounds for the error of the linear finite element solution. They enjoy the following properties:

- They are constant-free, or guaranteed, in that they do not involve any constant which is not explicitly known or difficult to estimate sharply.
- They are essentially insensitive to perturbations of the problem data that do not affect the error of the finite element solution.
- They are complemented by lower bounds (which, as without obstacles, involve constants and oscillations terms).

Consequently, these upper bounds quantify rather precisely the error of a given approximate solution and may be used to direct and to stop safely and efficiently an adaptive iteration.