Obstacle problem for the p-Laplacian and its a posteriori analysis

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We discusses the functional error identity and estimates, which are performed for measures of deviations from exact solutions of the obstacle problem for the p-Laplace operator. They are fulfilled for any function from the admissible (energy) functional class that contains the generalised solution of the problem. In doing so, no special properties of the approximations or numerical procedures are used. Also, no informa- tion about the exact configuration of the of the coinsidence set is needed. The right-hand side of the identity and estimates contains only known functions and can be explicitly computed, while the left one represents a certain measure of the deviation of the approximate solution from the exact one. The obtained functional relations allow us to estimate the error of any approximations of the problem irrespective of the method of their obtaining. In addition, they allow us to compare the exact solutions of problems with different data, which makes it possible to to estimate the errors of mathematical models, for example, those that that arise when simplifying the coefficients of a differential of a differential equation.

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