

ERROR IDENTITIES FOR NONLINEAR ELLIPTIC AND PARABOLIC PROBLEMS

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ABSTRACT

We consider error identities for a class of elliptic and parabolic equations. Left hand sides of the identities are natural measures of the distance between a function in the corresponding energy class and the exact solution. Right hand sides are either directly computable or serve as a source of fully computable error bounds. The identities possess an important consistency property and tend to zero under the conditions typical for approximations constructed by commonly used numerical methods. Therefore, the identities and related error estimates can be used for efficient error analysis of various approximations to direct and inverse problems generated by the discussed class of partial differential equations.

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