Title: Estimation of the algebraic error and stopping criteria in numerical solution of partial differential equations
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Abstract: After introduction of the model problem and its properties we describe the Conjugate Gradient Method (CG). We present the estimates of the energy norm of the error and a heuristic for the adaptive refinement of the estimate. The difference in the local behaviour of the discretization and the algebraic error is illustrated by numerical experiments using the given model problem. *A posteriori* estimates for the discretization and the total error that take into account the inexact solution of the algebraic system are then discussed. In order to get a useful perspective, we briefly recall the multigrid method. Then the Cascadic Conjugate Gradient Method of Deuflhard (CCG) is presented. Using the estimates for the error presented in the preceding parts of the thesis, the new stopping criteria for CCG are proposed. The CCG method with the new stopping criteria is then tested.