

A Convergence Theorem for Discretised Minimisation Problems

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Dedicated to Friedrich Stummel on the occasion of his 70th birthday

Abstract

Let a norm minimisation problem be given, where the minimisation takes place over the range of an in general nonlinear map. The given problem is approximated by a sequence of similar but finite dimensional minimisation problems. The convergence of the infima and the approximate solutions is studied in an abstract setting. As a special case general minimisation problems of functionals are included. Application of the abstract results are presented to nonlinear Chebyshev approximation, nonlinear approximation problems in L_p -spaces, a nonlinear defect minimisation problem for an elliptic boundary value problem and a minimisation problem for a convex functional in L_∞ . The paper partially extends earlier joint work by R. Reemtsen and the author [1], [2].

- [1] R.D. Grigorieff and R. Reemtsen: Discrete Approximations of Minimization Problems I. Theory. Numer. Funct. Anal. and Optimiz. **11** (1990) pp. 701-719.
- [2] R.D. Grigorieff and R. Reemtsen: Discrete Approximations of Minimization Problems II. Applications. Numer. Funct. Anal. and Optimiz. **11** (1990) pp. 721-761.

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