

# DISCRETE APPROXIMATIONS OF MINIMIZATION PROBLEMS

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## I. THEORY

### ABSTRACT

In this paper we study the convergence of the infima and of (approximate) solutions of a sequence of minimization problems. It is shown that the main assumptions needed in order to guarantee the requested convergence properties are those of the consistency and the  $\alpha$ -regularity of the underlying functionals, conceptions which are well-known from the discretization theory of differential equations. This paper is continued by a second part in which the theoretical results are applied to a number of concrete problems.

## II. APPLICATIONS

### ABSTRACT

In the first part of this paper [8] we have provided a number of theoretical results concerning the convergence of the infima and of (approximate) solutions of a sequence of minimization problems. In this paper we apply these results to a variety of special problems. Applications are various minimum norm problems, semi-infinite programming problems, the regularization by singular perturbation, and the discretization by nonconforming finite elements.

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