

A new class of nonlinear conjugate gradient coefficients for unconstrained optimization

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The nonlinear Conjugate gradient method (CGM) is a very effective way in solving large-scale optimization problems. Zhang *et al.* proposed a new CG coefficient which is defined by B_k^{NPRP} . They proved the sufficient descent condition and the global convergence for nonconvex minimization in strong Wolfe line search. In this paper, we prove that this CG coefficient possesses sufficient descent conditions and global convergence properties under the exact line search.

Keywords: Conjugate gradient method; exact line search; global convergence.

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1. Introduction

We consider the following unconstrained minimization problem:

$$\min_{x \in \mathbb{R}^n} f(x), \quad (1)$$

where $f : \mathbb{R}^n \rightarrow \mathbb{R}$ is a continuously differentiable function, the CG methods are widely used for solving large scale unconstrained optimization problems.

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