Homer F. Walker

Inexact Newton dogleg methods

Mathematical Sciences Department
Worcester Polytechnic Institute
Worcester
MA 01609-2280
walker@wpi.edu
Roger P. Pawlowski
John N. Shadid
Simonis, Joseph P.

The dogleg method is a classical trust-region technique for globalizing Newton's method. While it is widely used in optimization, including large-scale optimization via truncated-Newton approaches, its implementation in general Newton-Krylov methods or other Newton-iterative methods can be problematic. In this talk, we first outline a dogleg method suitable for the general inexact Newton context and provide a global convergence analysis for it. We then discuss certain issues that may arise with standard dogleg implementational strategies and propose modified strategies that avoid them. We conclude with a report on numerical experiments involving benchmark CFD problems.