Electronic Journal: Southwest Journal of Pure and Applied Mathematics
Internet: http://rattler.cameron.edu/swjpam.html
ISBN 1083-0464
Issue 1 July 1999, pp. 41 – 50
Submitted: January 11, 1999. Published: July 1, 1999

WEIGHTED SOBOLEV DESCENT FOR SINGULAR FIRST ORDER PARTIAL DIFFERENTIAL EQUATIONS

W. T. Mahavier

Abstract. The author's work on solving singular ordinary differential equations via steepest descent based on weighted Sobolev gradients is extended to first order partial differential equations with linear singularities. Results are presented which demonstrate the improvements obtained by computing based on weighted Sobolev gradients.

1991 A.M.S. (MOS) Subject Classification Codes. 65N06, 65N22

Key Words and Phrases. Sobolev descent, weighted Sobolev space, PDE, finite difference, numerical, pre-conditioning, least squares.

W. T. Mahavier. math-wtm@nich-nsunet.nich.edu