
An Interval Difference Method of Second Order for Solving an Elliptic BVP

Andrzej Marciniak¹, Małgorzata A. Jankowska², Tomasz Hoffmann³

¹Institute of Computing Science

Poznan University of Technology, Poznan, Poland

²Institute of Applied Mechanics

Poznan University of Technology, Poznan, Poland

³Poznan Supercomputing and Networking Center

Poznan, Poland

{andrzej.marciniak, malgorzata.jankowska}@put.poznan.pl

tomhof@man.poznan.pl

In the article we present an interval difference scheme for solving some general elliptic boundary value problem with Dirichlet' boundary conditions. The obtained interval enclosures of the exact solution contain all possible numerical errors. A numerical example presented, like a number of other numerical experiments carried out by us, confirms the fact that the exact solution is within the resulting interval enclosures.

Keywords: interval difference methods, elliptic boundary value problem, floating-point interval arithmetic.