
PAUL MUIR, Saint Mary's University, Halifax, Nova Scotia, Canada
New Software for the Numerical Solution of Differential Equations

The first part of this talk will provide an overview of the topics to be discussed by the speakers in this minisymposium. The talks will consider software packages for the numerical solution of differential equations, including ones for the interval computation of the solution of DAE systems, the numerical solution of delay differential equations, and the numerical solution of boundary value ODEs in several computing environments such as Matlab, C++, and Fortran.

The second part of the talk will focus on one such project involving a recent developed Fortran 95 package, called BVP_SOLVER, for the numerical solution of boundary value ODEs, written by the author together with Larry Shampine. This package uses defect control as the primary means of controlling the quality of the numerical solution but also provides an option for estimation of the global error as a post-processing step. BVP_SOLVER makes use of a number of features of the Fortran 95 language to enhance the user-friendliness of the code.

An overview of the capabilities of the new package will be followed by a brief description of recent work focused on improving the defect estimation algorithm employed by BVP_SOLVER. The code along with a number of sample application drivers is available at http://cs.smu.ca/~muir/BVP_SOLVER.Webpage.shtml.