User Interfaces for ODE Solvers

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Historically, high quality ODE solvers have been written in Fortran. With the emergence and maturation of PSEs, it is now possible to solve many ODEs efficiently and reliably using a PSE such as Matlab. Fortran solvers remain popular and necessary however since solutions of complex problems sometimes require the greater flexibility or speed of compiled computation available with a Fortran solver. One lesson from the popularity of PSEs and continuous simulation languages is the need for user interfaces which allow users to easily modify problems and to obtain output and high quality graphics quickly and conveniently while at the same time having access to the full power afforded by Fortran. We will describe the manner in which such an interface can be constructed and illustrate our remarks by discussing a public domain Perl-based interface developed using the GNU g77 compiler, the PSPLOT postscript graphics package, and the DKLAG6 differential equation solver.