Extrapolation methods in *Mathematica*

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In the first part of this talk some issues relating to data structures and the implementation of numerical methods for ordinary differential equations in the problem solving environment *Mathematica* will be discussed.

In the second part of the talk a new framework for solving ordinary differential equations will be outlined. Particular focus will be placed on the implementation of extrapolation methods, which are currently the methods of choice when high accuracy is desired. We will highlight some of the issues of how the framework has been developed in *Mathematica* and discuss some techniques for the reduction of compound rounding errors that have recently been implemented.

This is joint work with Robert Knapp (Wolfram Research, USA) and Giulia Spaletta (Bologna University, Italy).