Stability for Symbolic-Numeric Equation Solving and Symmetry Analysis

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Abstract

Group theory and numerical analysis by necessity entails combining symbolic and numeric computation. Stability of the resulting methods is a core issue and will be discussed during this talk.

In particular I will present some fundamental techniques on the stability of the roots of perturbed equation systems. Based on the definition of condition numbers, those techniques give backward error for numerical solving algorithms.

I will also discuss on how those techniques integrate in the open problems:

- the solving and conditioning of algebraic triangular sets
- the stability of the hybrid numeric/symbolic method of treatment of Approximate Lie symmetries of differential equations in the workshop talk by Greg Reid.