

Taylor Model-based Verified Integrators

Kyoko Makino, Martin Berz

Michigan State University, USA

We review the Taylor-model based integrator COSY-VI for the verified integration of ODEs and flows. Particular emphasis is given to the suppression of the infamous wrapping effect to very high accuracy while representing large ranges of initial conditions. We will discuss the technique of error parameterization, which not only further suppresses the growth of remainder errors but also provides guidance for automatic domain decomposition. The result is a verified integrator for long term integration of large ranges of initial conditions. We will show some examples to demonstrate the methods.