Reachability Analysis with Approximate B-series

An approximate B-series is a B-series computed with a Runge-Kutta scheme that does not satisfy the order conditions. However, by computing the local truncation error accordingly, an approximate B-series can be validated and then used for the reachability analysis of ordinary differential equations. It is then possible to modify the coefficients of a Butcher tableau specifically for an ODE.

A preliminary work of approximate B-series used for the reachability analysis of a toy example will be presented. Finally, surprising results will be discussed.