Strong stability preserving general linear methods

G. Izzo   Z. Jackiewicz

We investigate the strong stability preserving (SSP) general linear methods (GLMs) with two external stages and s internal stages. We also describe the construction of starting procedures for these methods. Examples of SSP methods are derived of order $p = 2$, $p = 3$, and $p = 4$ with $2 \leq s \leq 10$ stages, which have larger effective Courant-Friedrichs-Levy coefficients than the class of two-step Runge-Kutta (TSRK) methods introduced by Jackiewicz and Tracogna, whose SSP properties were analyzes recently by Ketcheson, Gottlieb, and MacDonald. Numerical examples illustrate that the class of methods derived in this paper achieve the expected order of accuracy and do not produce spurious oscillations for discretizations of hyperbolic conservation laws, when combined with appropriate discretizations in spatial variables.