Stability of collocation-based Runge-Kutta-Nystr??m methods

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Abstract: We analyse the attainable order and the stability of Runge-Kutta-Nystr??m (RKN) methods for special second-order initial-value problems derived by collocation techniques. Like collocation methods for first-order equations the step point order of s-stage methods can be raised to 2 s for all s. The attainable stage order is one higher and equals s+1. However, the stability results derived in this paper show that we have to pay a high price for the increased stage order. ?? 1991 BIT Foundations.

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