Polynomial Multipoint Methods

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Abstract

We present polynomial multipoint methods, a new class of time-stepping schemes for solving first-order ordinary differential equations. The method construction is based on polynomial interpolation, which allows for high-orders of accuracy as well as parallelism across the method. Order, linear stability, and adaptive time-stepping implementation will be presented, as well as connections to existing general linear methods [1, 2].

[1] J. C. Butcher. General linear method: A survey. *Applied Numerical Mathematics*, 1(4):273–284, 1985.

[2] J. C. Butcher. General linear methods. *Acta Numerica*, 15:157–256, 2006.