Note on the performance of direct and indirect Runge-Kutta-Nystr??m methods

huu Cong N.

Afdeling Numerieke Wiskunde, Centre for Mathematics and Computer Science, Amsterdam, Netherlands; Faculty of Mathematics, Mechanics and Informatics, University of Hanoi, Viet Nam

Abstract: This paper deals with predictor-corrector iteration of Runge-Kutta-Nystr??m (RKN) methods for integrating initial-value problems for special second-order ordinary differential equations. We consider RKN correctors based on both direct and indirect collocation techniques. The paper focuses on the convergence factors and stability regions of the iterated RKN correctors. It turns out that the methods based on direct collocation RKN correctors possess smaller convergence factors than those based on indirect collocation RKN correctors. Both families of methods have sufficiently large stability boundaries for nonstiff problems. ?? 1993.

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Correspondence Address: huu Cong, N.; Afdeling Numerieke Wiskunde, Centre for Mathematics and Computer Science, Amsterdam, Netherlands

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Authors with affiliations:

1. huu Cong, N., Afdeling Numerieke Wiskunde, Centre for Mathematics and Computer Science, Amsterdam, Netherlands, Faculty of Mathematics, Mechanics and Informatics, University of Hanoi, Viet Nam