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Singly Diagonally Implicit Runge-Kutta Methods Combining Line Search Techniques forUnconstrained Optimization

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摘要
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Singly Diagonally Implicit Runge-Kutta Methods Combining Line Search Techniques for Unconstrained Optimization

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Abstract There exists a strong connection between numerical methods for the integration of ordinary differential equations and optimization problems. In this paper, we try to discover further their links. And we transform unconstrained problems to the equivalent ordinary differential equations and construct the LRKOPT method to solve them by combining the second order singly diagonally implicit Runge-Kutta formulas and line search techniques. Moreover we analyze the global convergence and the local convergence of the LRKOPT method. Promising numerical results are also reported.

Key words Global convergence Superlinear convergence Runge-Kutta method Unconstrained optimization

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