Asymptotic stability analysis for recursive multirate Rosenbrock- and Peer-methods

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Many physical phenomena contain different time scales. One way to solve the descriptive PDE is to discretize first in space and then apply a normal singlerate time integrator to the resulting ODE system. For problems with different time scales this might end up in very small time steps which have to be applied also to components with much less activity. That is why the application of multirate methods is reasonable (see e.g. [1]). Different time step sizes are used for different components, depending on their individual activity. Since the stability character of a singlerate method usually is not carried over to the corresponding multirate method, we study the asymptotic stability for several multirate Rosenbrock- and Peer-methods [2, 3].

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References

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