Physikalisches Kolloquium

Marlis Hochbruck, KIT

»On the stability of leap-frog type methods«

Einführung: C. Rockstuhl

In this talk we discuss the stability of leap-frog type methods. The standard test problem to study the stability is the unforced harmonic oscillator with a fixed frequency. It is well known that the leap-frog method is stable (in the sense that the approximation remains bounded uniformly w.r.t. the simulation time) if the product of the frequency with the time step size is strictly smaller than two. Modifications of the leap-frog method which weaken this strong step size restriction have been recently proposed in the literature. However, these schemes lose the stability property of the leap-frog method.

In this talk we present a general stability result for such time integration methods and show how to construct stable variants of the leap-frog method allowing for larger time step sizes. Numerical results show the superior stability and convergence properties of these new methods compared to recent schemes.

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Freitag, 18.01.2019, 15:45 Uhr,

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Anschließend Nachsitzung.