

***Uniformly accurate low regularity approximations for the
Klein-Gordon equation and Klein-Gordon-Schrödinger systems***

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We propose a novel class of uniformly accurate integrators for the Klein–Gordon equation and Klein-Gordon-Schrödinger systems which capture classical $c = 1$ as well as highly-oscillatory non-relativistic regimes $c \gg 1$ and, at the same time, allow for low regularity approximations. In particular, our first- and second-order schemes require no step size restrictions and, in addition, lower regularity assumptions than classical schemes, such as splitting or exponential integrator methods. Furthermore, the new schemes preserve the nonlinear Schrödinger (NLS) limit on the discrete level.

This is joint work with Katharina Schratz (Sorbonne University).