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Comparing the performance of time-dependent-Schrödinger-equation solvers for the 800-nm, one-electron-atom, strong-field problem B.D. ESRY, YUJUN WANG, D. URSREY, Kansas State University, HENRIK R. LARSSON, Christian-Albrechts-Universität zu Kiel, D.J. TANNOR, Weizmann Institute of Science, NICOLAS DOUGUET, KLAUS BARTSCHAT, Drake University, A.N. GRUM-GRZHIMAILO, Lomonosov Moscow State University, BRUNO SCHULZ, ALEJANDRO SAENZ, Humboldt-Universität zu Berlin, L MARDER, Theoretische Physik, Universität Kassel, D.M. REICH, C.P. KOCH, Universität Kassel, A. SCRINZI, Ludwig Maximilians Universität, F. MORALES, T. BREDTMANN, H.G. MULLER, S. PATCHKOVSKII, Max-Born-Institute, XIAO WANG, F. ROBICHEAUX, Purdue University, V. MOSERT, D. BAUER, Universität Rostock, X.M. TONG, University of Tsukuba, J. SVENSMARK, Kansas State University — Numerical solutions of the strong-field time-dependent Schrödinger equation (TDSE) have been pursued for decades, leading many to consider it a "solved" problem. While it is "solved" in the sense that many methods do exist for its solution, their relative performance ranges over orders of magnitude. Moreover, these methods are still so resource intensive that they are rarely used to carry out a full, quantitative comparison with experiment. An accurate and efficient TDSE solver is thus critical, and the first step towards improving the state-of-the-art is identifying it. To this end, we will present a comparison of several common methods, thereby providing an informed starting point for future efforts to develop TDSE solvers as well as a yardstick to measure them against.

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