

Erratum: Tests of Numerical Simulation Algorithms for the Kubo Oscillator¹

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In our earlier account of the stochastic simulation of the Kubo oscillator, we reported a considerable amount of excellent agreement between the numerical simulations and analytic expressions. Throughout the paper, the agreement for the phase angle statistics was very encouraging *vis à vis* the algorithms of Sancho *et al.*⁽¹⁾ and Riskin.⁽²⁾ However, we reported a decay in the radius (Figs. 13 and 14) which should not have occurred, because analytically the radius is conserved. This putative decay is the result of a programming “error” which intrinsically violated radius conservation. The error resulted from the staggered updating of two variables (the real and imaginary parts of the Kubo oscillator amplitude). When simultaneous updating is used (as is guaranteed by Runge-Kutta-type programs,⁽³⁾ no decay is observed, and results indistinguishable from Fig. 15 are obtained for the Sancho *et al.* and Riskin algorithms, as well as for the colored noise algorithm that worked so well and was reported in the paper.

As it turns out, sometimes the staggered updating works better than the simultaneous updating. This situation has been observed in laser simulations involving an injected field. However, the variables are not constrained by a conservation law, as in the Kubo oscillator case.

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