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E LGSS models

For the simulations of the LGSS models we used an explicit two-step Runge-Kutta scheme, described in detail by Milstein (1995, §3.4, Theorem 3.3) and implemented in C++. Our source code is given as a separate supplement. The carrying capacity K and the intrinsic growth rate r were both normalized to 1, hence characteristic population sizes and time units are both 1. The standard deviation σ and the ratio ε/σ were randomly and uniformly chosen within the intervals $[0.01, 0.2]$ and $[0, 2]$, respectively. For the cyclic model, the ratio α/σ and the oscillation amplitude T were chosen uniformly within $[1, 3]$ and $[0.5, 4]$, respectively. The amplitude A was calculated from the chosen α and T using

$$A = \frac{\alpha}{r}\sqrt{r^2 + (2\pi/T)^2}. \tag{E.1}$$

Cases for which $A \geq K$ were skipped. Simulations ran for 25 time units and time series comprised 50 points. The integration time step was $\delta t = 0.0002$. We generated 10^4 independent time series for the non-cyclic as well as the cyclic model. Initial population sizes were chosen randomly according to the theoretical stationary distribution in the small-noise limit (i.e. as Gaussian variables with variance σ^2 around the deterministic trajectory). Periodograms were analyzed as described in Band OUSS FAPs were corrected as described in C.

LITERATURE CITED

Milstein, G. 1995. Numerical Integration of Stochastic Differential Equations. Mathematics and its Applications, Kluwer, Dordrecht, The Netherlands.