Nonlinear Sciences > Chaotic Dynamics

Pseudo resonance induced quasi-periodic behavior in stochastic threshold dynamics

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Here we present a simple stochastic threshold model consisting of a deterministic slowly decaying term and a fast stochastic noise term. The process shows a pseudo-resonance, in the sense that for small and large intensities of the noise the signal is irregular and the distribution of threshold crossings is broad, while for a tuned intermediate value of noise intensity the signal becomes quasi-periodic and the distribution of threshold crossings is narrow. The mechanism captured by the model might be relevant for explaining apparent quasi-periodicity of observed climatic variations where no internal or external periodicities can be identified.

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