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Modelling and simulation of autonomous oscillators with random parameters

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Review text:

A random process corresponding to an autonomous oscillator with random parameters depends on the choice of a phase condition is considered. An appropriate quantification of uncertainties is achieved by a random process with a minimal total variance. The author has shown a necessary condition for an optimal solution using the calculus of variations. A corresponding numerical method has been constructed based on expansions of the random process as well as the random period in the generalised polynomial chaos. A Galerkin projection yields a larger coupled system to determine an approximation of the random process and the random period. The author resolved the stochastic model for two test examples, where a minimal total variance is achieved. Elementary phase conditions may result in suboptimal random process. Some phase conditions yield a larger variance as shown in the numerical simulations.

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