PHASE DESCRIPTION OF STOCHASTIC OSCILLATIONS

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Abstract. We introduce an invariant phase description of stochastic oscillations by generalizing the concept of standard isophases. Numerically, the average isophases are constructed as Poincare surfaces of sections showing constant average return times. The dynamics of the resultant phase is on average decoupled of the amplitude dynamics. The proposed method allows for a natural extension of phase description to noise-induced oscillations. Furthermore, the approach can be used for an improved phase extraction from oscillatory signals.