Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Steering most probable escape paths by varying relative noise intensities[1] STEPHEN TEITSWORTH, PAUL DANNENBERG, JOHN NEU, Duke University — We demonstrate the possibility to systematically steer the most probable escape paths (MPEPs) by adjusting the relative noise intensities in non-gradient dynamical systems that exhibit escape from a metastable point via a saddle point in the limit of small noise. Based on a geometric formulation of this escape process, an asymptotic theory is developed which is broadly applicable to fast-slow systems of two or more dimensions. In simple systems, our theory permits analytical expressions for the MPEPs and their associated minimum action values as a function of the relative noise intensities. These analytical predictions are in excellent agreement with computed MPEPs obtained using a geometric minimum action method (gMAM) [1], and both of these results are consistent with prehistory probability distributions obtained by direct simulation of the underlying stochastic differential equations. [1] M. Heymann and E. Vanden-Eijnden, Phys. Rev. Lett. **100**, 140601 (2008).

[1]supported in part by NSF grant DMR-0804232

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Date submitted: 15 Nov 2013 Electronic form version 1.4