Abstract Submitted
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Enhancement of neural response by diversity[1] TONI PEREZ, Physics Department, Lehigh University, Bethlehem, PA, CLAUDIO MIRASSO, RAUL TORAL, Instituto de Fisica Interdisciplinar y Sistemas Complejos, IFISC, UIB-CSIC, Palma de Mallorca, Spain, JAMES D. GUNTON, Physics Department, Lehigh University, Bethlehem, PA — Synchronization between the constituents of an ensemble is common in Nature. This global behavior can originate from a common response to an external stimulus or might appear in au- tonomous systems. Recent studies indicates that diversity among the constituents might play a positive role in setting a common behevior [1]. In this work we focus on the role of diversity in di?erent neurons models such as the Fitzhugh-Nagumo and Morris-Lecar models. We have ob- served that under certain conditions diversity can enhance the response of the system to an external periodic modulation. We have also found that the number of coupled units become fundamental in the enhancement of the response of the system. This results suggest that diversity present in biological systems may have an important role in order to enhance the response of the system to weak signals.

[1] C.J. Tessone, C.R. Mirasso, R. Toral and J.D. Gunton, Phys. Rev. Lett. 97, 194101 (2006)

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