# Two-state on-off like intermitency scenario in a Hindmarsh-Rose neuron network

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Partial phase synchronization, also reported as neuron cooperation, is a pivotal behavior of the brain and related to its main features, such as memory. The excess or even the lack of phase synchronization are associated with brain disorders like epilepsy and Parkinson's disease. We show in homogeneous network of Hindmarsh-Rose (HR) neurons presents hysteresis due to coupling in a global network [1]. To continue this work we suggest using heterogeneous neuron networks. In this case, the presence of heterogeneity the hysteresis intervals become an intermittency rule. In this work we present an on-off intermittency model to explain this phenomenon. We observe the distribution of laminar duration sizes and noticed as a power law rule to the points closest to the critical coupling, and the distribution of laminar duration sizes respect a exponential rule to the most distant points. The study also brings useful information to the general understanding of network-phase-synchronization processes.

## References

[1] E. B. S. A. Cambraia, J. V. V. Flauzino, T. L. Prado, and S. R. Lopes, "Dependence on the local dynamics of a network phase synchronization process," *Physica A: Statistical Mechanics and its Applications*, vol. 619, p. 128750, 2023.

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