

Dynamical Study of the Influence of Adaptive Coupling in Mean-Field Models of Neural Populations

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SUMMARY

The study of neural populations is of increasing interest. In the literature, we find two recent mean-field models that represent the dynamics of heterogeneous all-to-all coupled quadratic integrate-and-fire spiking neural networks with adaptive synaptic dependence (cf. [1]) and without it (cf. [2]). Both models are linked through a parameter related with the synapsis. In this communication, we study the changes of the dynamics when the value of this parameter increases (chaotic behaviour disappears and bursting dynamics emerge) and the bifurcations underlying these changes (cf. [3],[4]). Moreover, we show how these mean-field models reflect the collective dynamics of neurons of two coupled populations even in the presence of noise, and we analyse their macro- and micro-dynamics (cf. [4]).

Keywords: coupled neural populations, synaptic adaptation, bifurcations, chaos

AMS Classification: 37Gxx, 37Mxx

References

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