

Triggering up states in all-to-all coupled neurons

Hong-Viet V. Ngo, Jan Köhler, Jörg Mayer, Jens Christian Claussen, Heinz Georg Schuster

(Submitted on 10 Mar 2010)

Slow-wave sleep in mammals is characterized by a change of large-scale cortical activity currently paraphrased as cortical Up/Down states. A recent experiment demonstrated a bistable collective behaviour in ferret slices, with the remarkable property that the Up states can be switched on and off with pulses, or excitations, of same polarity; whereby the effect of the second pulse significantly depends on the time interval between the pulses. Here we present a simple time discrete model of a neural network that exhibits this type of behaviour, as well as quantitatively reproduces the time-dependence found in the experiments.

Comments: epl Europhysics Letters, accepted (2010)

Subjects: **Neurons and Cognition (q-bio.NC)**; Statistical Mechanics (cond-mat.stat-mech); Chaotic Dynamics (nlin.CD); Biological Physics (physics.bio-ph)

Cite as: **arXiv:1003.2111v1 [q-bio.NC]**

Submission history

From: Jens Christian Claussen [[view email](#)]
[v1] Wed, 10 Mar 2010 13:50:57 GMT (45kb)

Which authors of this paper are endorsers?

Download:

- [PDF](#)
- [PostScript](#)
- [Other formats](#)

Current browse context:

q-bio.NC

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1003](#)

Change to browse by:

[cond-mat](#)

[cond-mat.stat-mech](#)

[nlin](#)

[nlin.CD](#)

[physics](#)

[physics.bio-ph](#)

[q-bio](#)

References & Citations

- [CiteBase](#)

Bookmark([what is this?](#))

[CiteULike logo](#)

[Connotea logo](#)

[BibSonomy logo](#)

[Mendeley logo](#)

[Facebook logo](#)

[del.icio.us logo](#)

[Digg logo](#)

[Reddit logo](#)