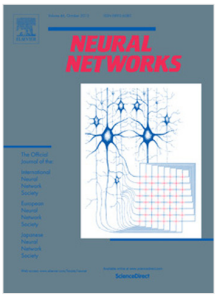
Accepted Manuscript



Bump competition and lattice solutions in two-dimensional neural fields

August Romeo, Hans Supèr

PII: S0893-6080(17)30155-7
DOI: http://dx.doi.org/10.1016/j.neunet.2017.07.003
Reference: NN 3784

To appear in: *Neural Networks*

Received date : 28 September 2016
Revised date : 19 May 2017
Accepted date : 2 July 2017

Please cite this article as: Romeo, A., Supèr, H., Bump competition and lattice solutions in two-dimensional neural fields. *Neural Networks* (2017), http://dx.doi.org/10.1016/j.neunet.2017.07.003

Elsevier Editorial System(tm) for Neural Networks

Manuscript Draft

Manuscript Number: NEUNET-D-16-00474R2

Title: Bump competition and lattice solutions in two-dimensional neural fields

Article Type: Article

Section/Category: Mathematical and Computational Analysis

Keywords: neural field models, self-organization, bumps, lattice

Corresponding Author: Dr. August Romeo,

Corresponding Author's Institution: Faculty of Psychology, University of Barcelona

First Author: August Romeo

Order of Authors: August Romeo; Hans Supèr

Abstract: Some forms of competition among activity bumps in a two-dimensional neural field are studied.First, threshold dynamics is included and rivalry evolutions are considered. The relations between parameters and dominance durations can match experimental observations about ageing. Next, the threshold dynamics is omitted from the model and we focus
on the properties of the steady-state. From noisy inputs,
hexagonal grids are formed by a symmetry-breaking process.
Particular issues about solution existence and stability conditions are considered. We speculate that they affect the possibility of producing basis grids which may be combined to form feature maps.