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Bump competition and lattice solutions in two-dimensional neural fields

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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.

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