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Title:

**Partial synchronization of neural activity and modelling of visual perception and attention**

**Abstract:**

Attention Model with Central Oscillator (AMCO) comprising a layer of the so-called peripheral oscillators interacting with a central oscillator has been developed. The functioning of the model is based on the principle of partial synchronization between the central oscillator and some subset of peripheral oscillators. We discuss two concepts of modelling of perceptual multi-stability of ambiguous figures: 1) dynamical intermittency with automatic reversals; 2) explicit control of reversals by the central executive of AMCO. Synaptic modification has been used to control biologically plausible model of visual selective attention of coupled Hodgkin-Huxley neurons. Dynamical regimes associated with development of the attentional focus are studied. It is shown that peripheral neurons with higher firing rates are selected preferentially by the attention system. The model correctly reproduces some observations on mechanisms of the attentional control, such as the coherence of spikes in the population of neurons included in the focus of attention, and the inhibition of neurons outside the focus of attention.