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Information transfer in ampullary electroreceptors ALEXANDER NEIMAN[1], Ohio University, TATIANA ENGEL, Max Planck Institute of Colloids and Interfaces — Many neurons in central nervous system and in sensory periphery are characterized by significant correlations between consequent interspike intervals of their stochastic spontaneous activity. Such non-renewal stochastic dynamics can result from internal properties of a neuron, such as spike-frequency adaptation, as well as from external perturbations or both. We consider one example of such system, peripheral ampullary electroreceptors in paddlefish. Spontaneous dynamics of electroreceptors is characterized by extended serial correlations of interspike intervals resulting from nonlinear interaction of two stochastic oscillators embedded into the system. Using computational modeling and approaches from information theory we show that these correlations significantly improve information transfer of weak external stimuli.

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