

Poster presentation

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Optimal coupling in noisy feed forward leaky integrate and fire network

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We study the stochastic resonance (SR) phenomenon in feed-forward networks of leaky integrate and fire (LIF) neurons. It is shown for various input frequencies, amplitudes and network sizes that the appropriate coupling strength can improve the output signal to noise ratio (SNR). We demonstrate that the value of the optimal coupling strength in the content of SR depends primarily on the absolute refractory period. Other circumstances, signal frequency, amplitude and network size play minor role to determine this value (see Figure 1), consequently it is possible to optimally pretune the system. The optimal coupling strength jumps to discrete values as the noise

increases and we discuss the background of this phenomenon.

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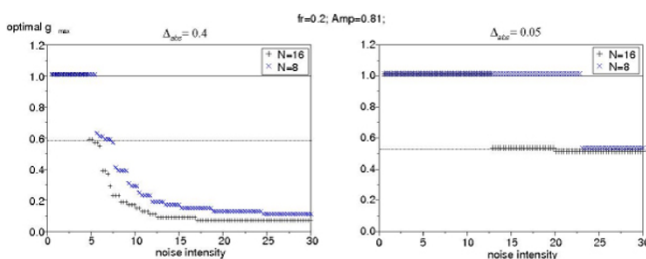


Figure 1
Optimal coupling strength as the function of noise intensity with different absolute refractory period. Dotted lines help the comparison of the first optimal coupling values.