

In this work is presented stochastic model of binaural hearing in context of another alternative models. According to latest experimental data on mammals, inhibition plays a role in interaural time difference recognition, which is a key for low frequency sound source localization. The outputs of experiments may lead to the conclusion that the binaural hearing works differently in mammals compared to birds. Nowadays there are a few theoretical works addressing this new phenomena, but all of them are relaying on a very precise inhibition timing, which was never proved as physiologically valid. On the other hand, models described in this work are based on the fact, that every neuron has a random delay when reacting to an excitation. If this time jitter is taken into account and combined with inhibitory signal, delay in the neuronal circuit and coincidence detection, then the output firing rate corresponds to the azimuth of the sound source. In this work it is shown, that such a neuronal circuits are giving the same output results compared to experimental data. The models are supported by analytical computations and numerical simulations including simulation of cochlear implant.