

## The 10th Asia Pacific Physics Conference (APPC10)

**Dates: August 21-24, 2007**

**Location: POSCO International Center, POSTECH, Pohang, Korea**

The 10th Asia Pacific Physics Conference (APPC10) is to be held during August 21-24, 2007 in Pohang, Korea. This triennial meeting is organized under the auspices of the Association of Asia Pacific Physical Societies (AAPPS) and the Korean Physical Society (KPS). These are dedicated to the presentation and discussion of the latest developments and ideas in physics and related science in the Asia-Pacific physics communities. It is our great pleasure to invite you to attend APPC10 to be held in Pohang area in Korea.

**Notice:**

**"The submission period for the Proceedings of APPC10 has expired. Thank you for your participation."**

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- KPS (The Korean Physical Society)

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## Stochastic Spiking Coherence in Globally Coupled Neurons

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We consider a large ensemble of globally coupled subthreshold Morris-Lecar neurons. By varying the noise amplitude  $D$ , stochastic spiking coherence (i.e., noise-induced coherence between neural spikings) is numerically investigated. As  $D$  passes a lower threshold, a transition from an incoherent to a coherent state occurs because of a constructive role of noise to stimulate coherence between noise-induced spikings. However, when passing a higher threshold of  $D$ , another transition from a coherent to an incoherent state takes place due to a destructive role of noise to spoil the spiking coherence. Such an incoherence-coherence-incoherence transition may be well described in terms of the order parameter which is the mean square deviation of the global potential (i.e., the ensemble-averaged potential). We also characterize the degree of stochastic spiking coherence by using a coherence measure which reflects the degree of "resemblance" of the global potential to the local potential. Through competition of constructive and destructive roles of noise, stochastic spiking coherence with large coherence measure is found to occur in a large range of intermediate noise amplitude.

**Keywords :** Globally Coupled Neurons; Spiking Coherence