Seminar

Institute for Plasma Research

Title : Synthetic Genetic Oscillators, Quorum sensing and Multistability

Speaker : Dr. Syaml Kumar Dana
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Date : 7th November 2014, Friday

Time : 04.00 PM

Venue : Seminar Hall, IPR

Abstract:

Synthetic genetic oscillator (SGN) consists of three single genes connected in a cyclic order inhibiting each other, which mimics the circadian clock. A collection of such SGN units shows interesting dynamical features under a special type coupling called as quorum sensing. The quorum sensing coupling is well known in bacterial colony that demonstrates a coherent dynamics. Model of synthetically designed genetic oscillators with a quorum sensing coupling reproduces such collective behaviours.

In this talk, I would like to discuss about the dynamics of SGN and their collective behaviors. Most importantly, we implemented the SGN with an electronic circuit analog and explored some behaviours of practical importance.

1. Edward H. Hellen, **S. K. Dana,** Boris Zhurov, Evgeny Volkov, Electronic implementation of repressilator with quorum sensing feedback, PLoS ONE **8**(5), e62997 (2013).
2. E.H.Hellen, **S.K.Dana**, J.Kurths, E.Kehler, S.Sinha, Noise-Aided Logic in an Electronic Analog of Synthetic Genetic Networks, PLoS ONE 8(10), e76032 (2013).
3. E.H.Hellen, E.Volkov, J.Kurths, **S.K.Dana**, An electronic analog of synthetic genetic networks, *PLoS One* **6** (8), e23286 (2011).