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Nonlinear dynamics of spontaneously beating heart cells

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Abstract:

The observation of spontaneous calcium oscillations of ~ 1Hz in beating cardiac cells is typically explained by many coupled chemical reactions and parameters. We show that the separation of time scales of fast processes with slower calcium diffusion in the cell results in a single, non-linear dynamical
equation that characterizes these oscillations with only a few physically relevant parameters, determined from independent experiments. We furthe demonstrate, both experimentally* and theoretically, that a much slower ti scale (a persistence time of 10s of minutes) can be extracted from analysis of the noisy dynamics of beating.

*Experiments: Ido Nitsan and Shelly Tzlil, Technion

Date & Location:

Tuesday, March 2, 2021, 11:00
Zoom meeting