

Colloquium

Curvature Dependence of Propagating Velocity For A Simplified Calcium Model

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摘 要：

It is known that the relation between curvature and wave speed plays a key role in the propagation of two-dimensional waves in an excitable model. For typical excitable models (e.g., the FitzHugh–Nagumo (FHN) model), such a relation is believed to obey the linear eikonal equation, which states that the relation between the normal velocity and the local curvature is approximately linear. In this presentation, we show that for a caricature model of intracellular calcium dynamics, although its temporal dynamics can be investigated by analogy with the FHN model, the curvature relation does not obey the linear eikonal equation even in the limiting case. Hence, this caricature calcium model may be an unexpected excitable system, whose wave propagation properties cannot be always understood by analogy with the FHN model.