Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Wavelet-based protocols for ion channel electrophysiology[1]
ARMIN KARGOL, Loyola University New Orleans — Ion channel gating kinetics is usually represented as a discrete Markov model whose input is the applied membrane voltage and the output is the ionic current. A current paradigm in experimental ion channel electrophysiology is to subject the channels to static voltages, which results in equilibrium or near-equilibrium conditions. We implement a new type of rapidly fluctuating voltage inputs that drive ion channels into nonequilibrium distributions. We discuss an algorithm for generating time-varying voltage inputs as a composition of wavelets, which allows optimization of spectral and temporal properties of voltage inputs for specific purposes, such as model selection. The outputs of channel Markov models for the Shaker K^+ channels are compared to the experimental data (whole cell ionic currents) recorded from these channels.

[1]This work was partially supported by the Cottrell College Science Award (CC6481) from Research Corporation.

Armin Kargol
Loyola University New Orleans

Date submitted: 19 Nov 2007 Electronic form version 1.4