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**The Use of NRS Pulses to Select Among Competing Markov Models for the Same Ion Channel** NICK MARTINEZ, AZIDA WALKER, Department of Physics and Astronomy, University of Central Arkansas — Markov models are used to describe the probability of a system being in a certain state and is completely independent of the previous states. If the correct parameters are applied, these models have the ability to predict the random occurrence of protein unfolding to form ion channels. The Markov models of ion channels are used to determine the probability of the channel being in a number of possible states with one or more of these states corresponding to the channel being open. Using the patch clamp technique and data from single channel recordings with stepped potential protocols, Markov models are proposed for different ion channels. The transition rate parameters between states of the models are empirically determined. Using this current technique, researchers have proposed more than one Markov models for the same ion channel. It is argued that by using stepped potentials, the channel is always being observed at equilibrium. We present the use of non equilibrium response spectroscopy (NRS) technique where the randomly generated pulses constantly drive the channel far from equilibrium where the channel is observed. The NRS pulses selected will yield different expectations from competing models for an L-type voltage gated calcium channel.

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