1096-37-128 **Josh Jacobson*** (joshhjacobson@gmail.com), Department of Mathematics, St. Olaf College, Northfield, MN 55057, and **Peter Valdez** (pvald@hunter.cuny.edu), Department of Mathematics and Statistics, Hunter College, New York, NY 10065. *Numerical Analysis of Cardiac Electrophysiology Models.*

Cardiac electrophysiology is the study of electricity flow through the heart. The computational models used in the field typically describe cells using systems of nonlinear ordinary differential equations (ODEs); when cells are coupled together to form tissue, the medium becomes a nonlinear reaction-diffusion system that cannot be solved analytically. As a result, numerical techniques must be applied to find solutions. In practice, many implementations of these models use forward Euler as the integration scheme. Using three cardiac models of varying complexity from two to 29 coupled ODEs, we apply forward Euler and several other first- and second-order numerical integration schemes. We compare the methods to each other using different metrics, including run time, electrical wave structure, and the accuracy of electrical properties such as action potential duration and conduction velocity. Our analysis gives a better understanding of the costs and benefits of using various integration schemes and hopefully will enable researchers to achieve desired results in a shorter time. (Received August 01, 2013)