1163-92-102 **Eileen Figueroa*** (exf7951@g.rit.edu), School of Mathematical Sciences, Rochester Institute of Techology, Rochester, NY 14623, **James Garrison** (jamesgarrison99@gmail.com), Mathematics & Computer Science Department, Hampden-Sydney College, Hampden-Sydney, VA 23943, and **Michelle Hewson** (michellelhewson@gmail.com), Mathematics and Computer Science Department, Western Carolina University, Cullowhee, NC 28723. *A new coupling model of out-of-phase regions of electrical wave propagation in the heart.*

Ventricular fibrillation (VF) is a cardiac rapid rhythm disorder that is a leading cause of death in the United States. Discordant alternans, an out-of-phase spatial pattern of electrical waves within the heart, renders the heart susceptible to VF. Many mathematical models fail to replicate the observed spatial scale of this pattern. An "ephaptic" model of intercellular coupling, which can theoretically reduce the discordant alternans spacing, was used to describe the connectivity between cells. A computer simulation, based on the ephaptic model, was used to study discordant alternans spacing. Wave velocities and length scales were also obtained from the model, and simplified circuits were created to study the characteristics of the ephaptic connection. Linear differential equations and Fourier analysis were used to identify characteristic time scales in these circuits. The velocities obtained were consistent with these time scales, and were comparable to those observed in the heart. The length scales compared favorably to the theory of Echebarria and Karma and with experimental observations. The components of the ephaptic connection within the model are thus understood and can be manipulated to reduce the spatial scale of the discordant alternans pattern. (Received August 14, 2020)