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Electrical Wave Propagation in a Minimally Realistic Fiber Architecture Model of the Left Ventricle XIANFENG SONG, SIMA SETAYESHGAR, Department of Physics, Indiana University, Bloomington, IN — Experimental results indicate a nested, layered geometry for the fiber surfaces of the left ventricle, where fiber directions are approximately aligned in each surface and gradually rotate through the thickness of the ventricle. Numerical and analytical results have highlighted the importance of this rotating anisotropy and its possible destabilizing role on the dynamics of scroll waves in excitable media with application to the heart. Based on the work of Peskin[1] and Peskin and McQueen[2], we present a minimally realistic model of the left ventricle that adequately captures the geometry and anisotropic properties of the heart as a conducting medium while being easily parallelizable, and computationally more tractable than fully realistic anatomical models. Complementary to fully realistic and anatomically-based computational approaches, studies using such a minimal model with the addition of successively realistic features, such as excitation-contraction coupling, should provide unique insight into the basic mechanisms of formation and obliteration of electrical wave instabilities. We describe our construction, implementation and validation of this model. [1] C. S. Peskin, Communications on Pure and Applied Mathematics **42**, 79 (1989). [2] C. S. Peskin and D. M. McQueen, in *Case Studies in Mathematical Modeling: Ecology, Physiology, and Cell Biology*, 309(1996)

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