

Abstract Submitted  
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**Understanding a Period-Doubling Bifurcation in Cardiac Cells**

CAROLYN BERGER, Duke University, XIAOPENG ZHAO, Univeristy of Tennessee, DAVID SCHAEFFER, SALIM IDRIS, DANIEL GAUTHIER, Duke University — Bifurcations in the electrical response of cardiac tissue can destabilize spatio-temporal waves of electrochemical activity in the heart, leading to tachycardia or even fibrillation. Therefore, it is important to classify these bifurcations so that we can understand the mechanisms that cause instabilities in cardiac tissue. We have determined that the period-doubling bifurcation in paced myocardium is of the unfolded border-collision type. To understand how this new type of bifurcation manifest itself in cardiac tissue, we have also studied the role of calcium in inducing the bifurcation. We will discuss the nature of the unfolded border-collision bifurcation and present our results of dual voltage and calcium measurements in a frog ventricle preparation.

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