Type: Minisymposium Contribution

## Identification of cavities in a nonlinear model arising from electrophysiology

Monday, August 12, 2024 4:00 PM (30 minutes)

Detecting ischemic regions is paramount in preventing potentially fatal ventricular ischemic tachycardia. Traditionally, this involves capturing the heart's electrical activity through noninvasive or minimally invasive methods, such as body surface or intracardiac measurements. Insight into utilizing electrical measurements for ischemia detection can be gained through mathematical and numerical models of cardiac electrophysiology.

The ultimate objective is to integrate boundary measurements of potentials with a mathematical model of the heart's electrical activity to pinpoint the location, shape, and size of ischemic regions and/or infarctions.

A promising approach involves modeling ischemic regions as electrical insulators using the monodomain model.

This model, a semilinear reaction-diffusion system, provides a comprehensive description of cardiac electrical activity.

I will show that perfectly insulating regions can be uniquely determined by partial boundary measurements of the potential.

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