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Manuchehr Aminian* (aminian@colostate.edu), Department of Mathematics, 1874 Campus Delivery, Fort Collins, CO 80523, and **Helene Andrews-Polymenis, David Threadgill** and **Michael Kirby**. *Application of anomaly detection tools to mice telemetry data to infer health state.*

We discuss the application of anomaly detection tools for time series, such as Multivariate State Estimation Technique, to identify the onset of disease in mice. The data comes from an exploratory study to identify the broad range of immune responses to infection of Collaborative Cross mice to an inoculation of *S. typhimurium*. The mice are embedded with devices which continuously track basic vital signs such as core temperature and activity. These signals are approximately circadian while healthy, but exhibit a wide variety of behaviors post-inoculation. These signals are embedded using a time-delayed embedding which reveals the underlying geometry of the problem, from which we show how anomalies can be successfully detected. Finally, we explore how features built from these anomalies relate to corresponding clinical classifications of the mice's response to infection. (Received September 16, 2019)