1163-65-1592 **Anna Fitzpatrick*** (akfitzpatrick@wpi.edu), **Molly Folino** (mjfolino@wpi.edu) and **Andrea Arnold** (anarnold@wpi.edu). *Fourier Series Approximation of Time-Varying Parameters using the Ensemble Kalman Filter.*

In this work we utilize Fourier series approximation within the ensemble Kalman filtering framework to estimate time-varying system parameters. We demonstrate the capability of this approach in estimating high and low frequency sinusoidal forcing functions, as well as polynomial and step functions, in a mass-spring system. Results emphasize the importance of the choice of Fourier series terms in the corresponding parameter estimates. (Received September 15, 2020)