



**Joint MUMS Program Transition - SPUQ Workshop**  
**May 14-17, 2019**  
**SPEAKER/ABSTRACT**

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*“Emulation for Large Storm Surge Simulation Ensemble”*

**Abstract:**

As a building block for our storm surge emulator we are currently developing a statistical surrogate model that can predict the spatial patterns of simulated storm surge for any given hurricane location and its properties. This problem poses nontrivial statistical challenges due to the semi-continuous marginal distribution of the surge patterns and some severe nonstationarity in the input-output relationship. Our method combines a new emulation method for semi-continuous data and treed Gaussian process approach to mitigate these challenges. A preliminary application of our approach to storm surge patterns at selected locations in Southwestern Florida shows that the method is highly promising for emulating the complicated storm surge patterns from simulation. Some future research plan on optimal ensemble design will be also discussed.