

# WEAK-FORM LATENT SPACE DYNAMICS IDENTIFICATION WITH UQ

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## ABSTRACT

The Weak-form Latent Space Dynamics Identification (WLaSDI) method is a data-driven reduced-order model simulation algorithm [1]. In this talk I will describe the method including the specifics of the data compression, projection onto test functions, and local latent space model learning. Notably, with WLaSDI, the local latent space is obtained using weak-form system identification techniques, resulting in significantly enhanced noise robustness. Compared to the standard sparse identification of nonlinear dynamics (SINDy [2]) used in LaSDI [3], the variance reduction of the weak form guarantees a robust and precise latent space recovery, hence allowing for a fast, robust, and accurate simulation. We demonstrate the performance of WLaSDI and quantify their uncertainties on several benchmark problems.

## REFERENCES

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