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Small Unmanned Aircraft Systems (sUAS) rotor acoustic noise at unsteady thrusts JIE YANG, SAXTON-FOX THERESA, University of Illinois at Urbana Champaign — There is immense engineering interest to alleviate the acoustic noise of drones to pave the path of mass drone deployment for applications like Urban Air Mobility. Plentiful acoustic studies of rotor-propelled drones have been done in the past few years (Tinney et al., 2018; Kloet et al., 2017). However, most of them relied on an assumption of hovering or static thrust output. In this study, sound fields produced by a controlled small drone rotor under unsteady thrusts are recorded by a microphone array. Acoustic time-frequency analysis tools like wavelet transform and empirical mode decomposition are used (Stephenson et al., 2014). The acoustic signatures are studied with temporal rotor aerodynamics. In future work, 2D time-resolved PIV data on the rotor blade may be also incorporated.

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