

Abstract Submitted  
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**Advanced Supersonic Nozzle Concepts: Experimental Flow Visualization Results Paired With LES<sup>1</sup>** MATTHEW BERRY, ANDREW MAGSTADT, Syracuse University, CORY STACK, DATTA GAITONDE, The Ohio State University, MARK GLAUSER, Syracuse University, SYRACUSE UNIVERSITY TEAM, THE OHIO STATE UNIVERSITY TEAM — Advanced supersonic nozzle concepts are currently under investigation, utilizing multiple bypass streams and airframe integration to bolster performance and efficiency. This work focuses on the parametric study of a supersonic, multi-stream jet with aft deck. The single plane of symmetry, rectangular nozzle, displays very complex and unique flow characteristics. Flow visualization techniques in the form of PIV and schlieren capture flow features at various deck lengths and Mach numbers. LES is compared to the experimental results to both validate the computational model and identify limitations of the simulation. By comparing experimental results to LES, this study will help create a foundation of knowledge for advanced nozzle designs in future aircraft.

<sup>1</sup>SBIR Phase II with Spectral Energies, LLC under direction of Barry Kiel

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