

Abstract Submitted  
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**A Hybrid Grid Compressible Flow Solver for Large-Scale Supersonic Jet Noise Simulations on Multi-GPU Clusters<sup>1</sup>** ANDREW CORRIGAN, K. KAILASANATH, JUNHUI LIU, RAVI RAMAMURTI, DOUGLAS SCHWER, Naval Research Laboratory, NAVAL RESEARCH LABORATORY TEAM — A compressible flow solver for multi-GPU clusters has been developed for performing large-scale supersonic jet noise and other high-speed compressible flow simulations over hybrid grids. While supersonic jet noise simulations require the accurate representation of complex nozzle geometry and thus the use of unstructured grids, much of the domain geometry can be represented sufficiently with structured grids, which drastically reduces memory bandwidth consumption and storage. Therefore, hybrid grids are employed, which combine an unstructured grid representation in the vicinity of the nozzle with a structured grid representation in the wake region of the flow field. Performance benchmarks are drawn from large-scale runs performed using this solver, including a jet nozzle with chevrons and multi-species flows involving jet engine exhaust.

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