

Abstract Submitted  
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**Genetic Algorithm Optimization of Inlet Bleed Design for a Hypersonic Jet Engine with Mode Transition**<sup>1</sup> KYLE GAISER, MENG-SING LIOU, NASA GLENN RESEARCH CENTER COLLABORATION — A genetic algorithm coupled with computational fluid dynamic software is used to optimize the configuration of an engine inlet at a supersonic speed. The optimization program is written to calculate the pressure recovery of many varying bleed schedules throughout the inlet walls. The goal is to find the best combination of the bleed holes' locations, diameters, and flow rates such that a high pressure recovery is maintained. Parallel computing, by means of a NASA supercomputer, is used to run the algorithm efficiently. This is the first time a genetic algorithm has been applied to inlet bleed design. A test function is used to evaluate and debug the optimization algorithm. The genetic algorithm and its associated programs show potential for use in developing more efficient bleed schedules in a hypersonic engine.

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