

Abstract Submitted
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3-Dimensional Aerospike Nozzle Design¹ BENJAMIN STEVENS,
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— Our research has developed a computational tool that can characterize the performance of an aerospike nozzle. Performance characteristics that must be analyzed include thrust, nozzle weight, and specific impulse. The program employs an iterative method of characteristics algorithm to solve for the 3-dimensional flow field around a specified aerospike nozzle geometry, and uses the results to compute a better geometry. Compared to a conical aerospike nozzle, where the radius decreases linearly along the nozzle, the aerospike optimal design offers extremely high performance. The optimal design features a radius that decreases very quickly initially, but becomes more gradual along the axial direction. This design increases specific impulse, increases thrust, and decreases weight, giving the aerospike the potential to lower launch costs significantly.

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