Readers' Forum

Brief discussions of previous investigations in the aerospace sciences and technical comments on papers published in the AIAA Journal *are presented in this special department. Entries must be restricted to a maximum of 1000 words, or the equivalent of one* Journal *page including formulas and figures. A discussion will be published as quickly as possible after receipt of the manuscript. Neither the AIAA nor its editors are responsible for the opinions expressed by the correspondents. Authors will be invited to reply promptly.*

Comment on "Thrust Augmenting Ejectors, Part I"

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REFERENCE 1 presents a one-dimensional constant area analysis of thrust augmented ejectors. Some of the results in this paper are anticipated in Ref. 2, which also deals with constant pressure ejector theory. In particular, both papers demonstrate the existence of a thermodynamic second law constraint. Reference 2 also examines Fabri theory constraints, which are not considered in Ref. 1, but are nevertheless important.

References

[1] Alperin, M. and Wu, J.-J., "Thrust Augmenting Ejectors, Part I," *AIAA Journal*, Vol. 21, Oct. 1983, pp. 1428-1436.

[2] Emanuel, G., "Comparison of One-Dimensional Solutions with Fabri Theory for Ejectors," *Acta Mechanica*, Vol. 44, 1982, pp. 187-200.

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Reply by Authors to G. Emanuel

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THE authors of Ref. 1 have only recently become aware of the paper by G. Emanuel.[2] However, in view of the fact that much of our work predates this paper, we would not have referenced it had we been aware of its existence. Further, we seriously disagree with the Fabri and Siestrunck[3] "supersonic flow" constraint as limiting the validity of the second solution. Our reasons for this disagreement can only be explained by facts which we describe briefly in a paper presently submitted for publication.[4] Briefly, that paper explains the fact that the theory of the present authors can predict maximum mass flow ratios and provide information regarding the required ejector geometry for achievement of supersonic mixed flow. In fact the theory described in Ref. 4 provides more realistic agreement with experiment, without the constraint of "supersonic flow patterns," than that of the Fabri and Siestrunck theory. Therefore, the Fabri and Siestrunck theory cannot be used to limit the validity of the flows attributed to the second solution to the ejector flow problem described in Ref. 1. However, the Fabri and Siestrunck theory can provide useful information regarding the secondary flow rate when the primary nozzle poses a significant blockage to the secondary flow.

References

[1] Alperin, M. and Wu, J.-J., "Thrust Augmenting Ejectors, Part I," *AIAA Journal*, Vol. 21, Oct. 1983, pp. 1428-1436.

[2] Emanuel, G., "Comparison of One-Dimensional Solutions with Fabri Theory for Ejectors," *Acta Mechanica*, Vol. 44, 1982, pp. 187-200.

[3] Fabri, J. and Siestrunck, R., "Supersonic Air Ejectors," *Advances in Applied Mechanics*, Vol. 5, Academic Press, New York, 1958, pp. 1-34.

[4] Alperin, M. and Wu, J. J., "Remarks on Fabri and Siestrunck Air Ejectors," submitted to the *AIAA Journal*.

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