sidering the classical ideal gas, we have

$$p^* = p_t \left(\frac{2}{\gamma+1} \right)^{\frac{\gamma}{\gamma-1}} \tag{3}$$

where p^* is the static pressure at the sonic point on each streamline. From this equation it is found that

$$\frac{d}{d\eta} \log_e p^* = \frac{d\zeta_0}{d\eta} \frac{d}{d\zeta_0} \log_e p^* = \frac{d\zeta_0}{d\eta} \left\{ \frac{d}{d\zeta_0} \log_e p_t - \Gamma_0 \frac{d\gamma}{d\zeta_0} \right\} \tag{4}$$

since ζ_0 defined by Eq. (11) of Ref. 2 is obviously a function of η only. Using the corrected Eq. (14) of Ref. 2, we can easily conclude that

$$\frac{d}{d\eta} \log_e p^* = 0 \quad \left(\frac{d}{d\beta} \log_e p^* = 0 \text{ in Ref. 1} \right) \tag{5}$$

From this discussion it is obvious that the corrected Eq. (14) of Ref. 2 indicates only the fact that the static pressure at the sonic point must be constant across the streamlines.

Boraas has misinterpreted the relation $d(\log_e p^*)/d\beta = 0$ of Ref. 1. The quantity p^* of Ref. 1 is equal to that defined by Eq. (3), and is clearly a function of η (or β in Ref. 1) only. Then the condition of constant p^* does not mean constant static pressure along ξ = const. or $\partial p / \partial \eta = 0$ in the transonic portion.

The condition of Eq. (5), or more exactly $d(\log_e p^*)/d\eta = O(\epsilon)$ ($d(\log_e p^*)/d\beta = O(\epsilon)$ of Ref. 1), is necessary for the existence of Hall's type of transonic solution. This condition is warranted by the fact that the sonic line location is completely contained in the throat region or in the region $x = O(L)$, where L is the reference nozzle length defined both in Refs. 1 and 2. If this condition is not satisfied for some flow, the sonic line of such a flow cannot be completely contained in the geometric-throat region and then the problem cannot be solved in a closed form by applying Hall's technique. The necessary conditions for the existence of Hall's type of transonic solution for real gases will be discussed in detail elsewhere by the present author.

The conclusion in Ref. 2 (of reducibility of all nonuniformities into a variation in γ only) might perhaps be in error, since this is true only for the flows where the condition of Eq. (5) is satisfied.

Finally, the author would like to emphasize that, in spite of such errors, some of the results of Ref. 2 remain valid and valuable.

References

[1] Ishii, R., "Transonic Nozzle Flows of Gases with a Rate Process," *AIAA Journal*, Vol. 15, March 1977, pp. 299-300.

[2] Boraas, S., "Transonic Nozzle Flow with Nonuniform Gas Properties," *AIAA Journal*, Vol. 11, Feb. 1973, pp. 210-215.

ERRATA

Ionizational Nonequilibrium Heating During Outer Planetary Entries

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THE second author's name, as it appears on the top of pages 1326 and 1328, should read "T. -J. Kuo" instead of "T. -N. Kuo."

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Turbulent Mixing Coefficients for Compressible Coaxial Submerged and Coflowing Jets

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THE coefficients shown in Eqs. (4) and (5) of the subject paper were high by an order of magnitude. The correlative equations should read as follows:

$$K_v - K_{vo} = 0.066 M_5^{0.31} (\rho_1/\rho_5)^{-0.80} (u_\infty / |u_1 - u_\infty|)^{0.48} \tag{4}$$

$$K_c - K_{co} = 0.066 M_5^{0.32} (\rho_1/\rho_5)^{-1.18} (u_\infty / |u_1 - u_\infty|)^{0.385} \tag{5}$$

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Notice: SI Units

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George W. Sutton
Editor-in-Chief