the layer's outer edge. This MLR formulation is confirmed to a degree by the work of the Princeton group.[5,13]

5. Conclusions

In conclusion, then, the theory[3,4] of the present author, for the model set forth, is capable of describing, at least qualitatively, the basic flow behavior in the strong-interaction regime for hypersonic flow past the leading edge of a sharp flat plate—as far as can be confirmed from the experimental data available. Certain aspects of the model employed,‡ as well as the mathematics necessary to tie the three strong-interaction subregimes together, should be studied further; however, it is felt that (the first step in) a theory§ for the strong-interaction regime does exist.

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‡ Recently, Lee and Cheng[14] have presented results for the (ordinary) hypersonic strong-interaction regime for $\omega = 1$ which confirm the existence of the viscous transition layer. Their results may be applied directly to the ISLR of the present theory. For $\omega = 1$, there is no distinct viscous shock layer and, hence, a VSLR does not exist. Thus, just the ISLR and MLR exist for $\omega = 1$. Since, experimentally, $\omega \sim \frac{3}{4} \neq 1$, the present analysis with $\omega < 1$ should be more than adequate.

§ For numerical analyses of this hypersonic flat plate problem, the readers are referred to the papers of Rudman and Rubin[15] and Cheng and Chen.[16]

Comments on "Class of Nonlinear Third-Order Systems Reducible to Equivalent Linear Systems"

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THIS Comment is intended to support a recent interesting Note by Dasarathy and Srinivasan.[1] In several short Notes,[2–7] the writer has been advocating the usefulness of elementary transforms (changes of variables) for some nonlinear differential equations.[8] Because Riccati's nonlinear differential equations are frequently used by radio engineers for nonuniform transmission lines, many of the Notes concern these equations. However the approach is general.

In contrast to advanced semester- or year-long courses on nonlinear differential equations, these elementary approaches can be taught to sophomore or junior students in a single two-hour lecture. Thus students may be able to use elementary transforms in their early undergraduate life.

Incidentally, Eq. (11) of Ref. 1 may be rewritten as

$$x(d/dt)[(\ddot{x}/x) + (bx^2/2)] = 0$$

Because $x(t) \neq 0$, using C (a constant),

$$2\ddot{x} + bx^3 - 2Cx = 0$$

is derived. This shows that $x(t)$ may be a response of a second-order system formally, but this is a third-order system because C has not yet been determined.

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† Reference 8 states that there are no general rules for solving nonlinear differential equations, and skill and ingenuity are essential.