Comment on "The Lift Force Due to von Kármán's Vortex Wake"

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AS a scientist working with problems of separated flows, I recently read with interest the paper by Sallet[1] concerning the lift force due to a vortex street. Equation (46)[1] relates the dimensions of the vortex street to the drag of the body

$$S^2\left(\frac{l}{d}\right)^3 + 0.529\, S\left(\frac{l}{d}\right)^2 - 1.529\,\frac{l}{d} + 1.593\, C_D = 0$$

where S is the Strouhal number, l the longitudinal vortex spacing, d the width of the body, and C_D the drag coefficient. The Strouhal number, as calculated from Eq. (46), is plotted in Fig. 1 together with experimental values collected from Refs. 2 and 3, as function of the wedge angle. It can be seen that the agreement between theory and experiment is very good.

It may be pointed out that in the work by Fage and Johansen,[2] the dimensions of the vortex street, the Strouhal number, and the drag of the body have been measured. Then the comparison between theoretical and experimental Strouhal numbers is most satisfactory (see also Ref. 4).

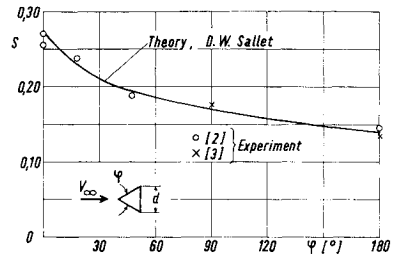

Fig. 1 Comparison of the theory of Sallet with experimental values.

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Index categories: Hydrodynamics; Jets, Wakes, and Viscid-Inviscid Flow Interactions; Marine Mooring Systems and Cable Mechanics.

References

[1]Sallet, D. W., "The Lift Force Due to von Kármán's Vortex Wake," *Journal of Hydronautics,* Vol. 7, No. 4, Oct. 1973, pp. 161–165.

[2]Fage, A. and Johansen, F. C., "The Structure of Vortex Sheets," *The Philosophical Magazine,* Ser. 7, Vol. 5, 1928, pp. 417–441; ARC R & M 1143, 1927, Aeronautical Research Council, London, England.

[3]Roshko, A., "On the Drag and Shedding Frequency on Two-Dimensional Bluff Bodies," TN 3169, 1954, NACA.

[4]Tanner, M., "Ueber die Strömungsvorgänge beim periodischen Totwasser," DLR FB 66-71, 1971, Deutsche Luft-und-Raumfahrt, F.R. Germany.