depends on vortex shedding and vortex shedding also depends on the aspect ratio. Therefore, in this case, the aspect ratio should be an important parameter.

### Author: Y. Kubo

R.L. WARDLAW: Figure 3 indicates that with the two-degree-of-freedom suspension, the torsional motion excited by vortex shedding with the one-degree-of-freedom is suppressed. Do your experiments provide an explanation for the dominance of the heaving motion with the one-degree-of-freedom system?

*Response*: Heaving oscillations in 2-D.O.F. systems appear in the region of non-overlap for the occurrence of torsional and heaving oscillations. The torsional motion, however, has a self-start in the overlap region ($V=2.5$–$5.0$ m/s) and changes to heaving at large amplitudes. The torsional oscillation did not reach a stable amplitude, however, and therefore we could not plot the torsional amplitude of the 2-D.O.F. system in the figure.

A. LANEVILLE: Was the Reynolds number in the flow visualization similar to the one in the pressure measurements? If not, could the authors comment on the effect of this difference on the shear layer behavior?

*Response*: The Reynolds number was not the same for both tests. Measurements of static forces indicate that bodies such as H and rectangular section cylinders are not greatly influenced by the Reynolds number. Therefore, the shear layer on the surface of the H-section cylinders is probably not significantly influenced by the Reynolds number, but, strictly speaking, I am not sure.

## NUMERICAL AERODYNAMICS

### Author: S. Murakami

R.N. MERONEY: In your paper your designate models that solve transport equations for the Reynolds' stress terms as the algebraic stress method (ASM). Other authors (e.g., Yamada and Mellor, Rodi, Meroney) call ASM the method which replaces $u_iu_j=f(k,\epsilon,\bar{U})$ by algebraic equations. Such an approach does not assume gradient transport, i.e., $(u_ju_j\propto \partial\bar{U}/\partial x)$; thus, it permits non-equilibrium turbulence conditions. Yet the method is not more computationally difficult than the $k$-$\epsilon$ method. Have you tried such a method?

*Response*: We applied the ASM to room air flows and got successful results. ASM can analyze the turbulence characteristics much more clearly than the $k$-$\epsilon$ model. It is not as easy, however, to get a stable solution, because the mean momentum equations do not contain a diffusion term in the ASM.