

عنوان مقاله:

Effect of Gap Ratio on the Wake behind Two Side-by-Side Flat Plates

محل انتشار:

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نویسندگان:

B. Shin - Department of Mechanical Design Systems Engineering, University of Miyazaki, Miyazaki, ۸۸۹-۲۱۹۲, Japan

M. Kondo - Graduate School of Engineering, University of Miyazaki, Miyazaki, ۸۸۹-۲۱۹۲, Japan

خلاصه مقاله:

The flow behind two flat plates placed normal to the flow in side-by-side arrangement was experimentally investigated by varying the gap ratio G^* (the ratio of gap spacing to plate width) in the range of $0.0 \leq G^* \leq 2.5$ to examine the effect of gap ratio on the wake. The flow patterns around the plates were observed using the hydrogen bubble flow visualization in the water tunnel. Velocity and pressure components were acquired by employing hot-wire anemometers and digital manometers in the wind tunnel. From the experiment, it has been found that, at gap ratios less than 1.6, the gap flow was biased either upward or downward and maintained a stable biased flow pattern. The width of the wake on the biased side was increased with the gap ratio, while that on the unbiased side was decreased. At $1.6 \leq G^* < 2.0$, the switching of the biased gap flow appeared due to the flow instability by mutual interference of the vortex shedding from the plates, while at G^* of 2.0 or more, the gap flow was no longer biased. The plates on the biased side showed relatively low base pressure and high velocity, and detected periodic vortex shedding, while those on the unbiased side showed the opposite phenomena. At gap ratios less than 2.0, two Strouhal numbers indicating the bi-stable situation exist, and the difference between the two Strouhal numbers decreased with the gap ratio.

کلمات کلیدی:

Vortex interference, Wake, Two flat plates, Side, by, Side arrangement

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