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Experimental Study of Leading Edge Receptivity to Freestream Local Disturbance YU NISHIO, TOMONARI OKA, SEIICHIRO IZAWA, YU FUKUNISHI, Tohoku University — Leading edge receptivity of a flat plate is investigated in a wind tunnel experiment. Sheet-jet type velocity fluctuations are introduced into the freestream using a wing-shaped disturbance generator installed upstream of the plate. Steady or pulsating jet is ejected from the generator filling the velocity deficit of the generator body. So the device generates velocity fluctuations without changing the velocity profile. Whether the generated velocity fluctuations affect the growth of fluctuations inside boundary layer is examined in detail. When the generator is placed at the same height as the stagnation point of the leading edge, the velocity fluctuations taken into the boundary layer just monotonically decay. On the other hand, when the generator is placed slightly higher than the stagnation point level, the velocity fluctuations inside the boundary layer tentatively grow showing higher receptivity, which gradually decay downstream. The strength of the velocity fluctuations inside the boundary layer are related to the velocity fluctuations outside the boundary layer. The effects of pulsating the jet are limited in both experiments.

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