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On spatial arrangement of vortex-generator type plasma actuator for separation control of airfoil flow MAKOTO SATO, CHINATSU KOBAYASHI, Kogakuin University — LESs on separation control flows around a NACA4418 have been conducted. In the separation control, a vortex-generator type plasma actuator (VG-PA) has been adapted. The flow conditions and the configurations of the plasma actuator are set based on the previous experimental study The Reynolds number is 85000 with angle of attack 18 deg. The effects of spanwise spacing of the VG-PA have been mainly investigated. The spacing of the VG-PA is set as $0.05c$, $0.1c$, $0.2c$, $0.3c$, and $0.4c$, where c means the chord length. The maximum lift is attained in the case with $0.1c$. On the other hand, a streamwise vortex generated by the VG-PA in a boundary layer flow has been investigated to clarify the distribution of the vortex. The streamwise vortex is distributed from the actuator to $0.1c$ away from the actuator in the induced flow direction. It means that the most effective control for the lift increase can be achieved for the case that the streamwise vortex generated by the VG-PA collides with the opposite streamwise vortex. In addition, from the results of $0.05c$ and $0.1c$, the location of the streamwise vortex collision is also important factor for the effective control.

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