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Experimental investigation toward thrust improvement in multiple-electrodes plasma actuator HARUKI FURUKAWA, SHINTARO SATO, MASAYUKI TAKAHASHI, NAOFUMI OHNISHI, Tohoku University — In recent years, dielectric-barrier-discharge (DBD) plasma actuators have attracted attentions as a fluid control device. However, a flow velocity induced by a single DBD plasma actuator is insufficient (about several m/s) to control a large-scale flow. It is effective to arrange several DBD plasma actuators to induce a higher velocity flow, which is called by the multiple-electrodes plasma actuator. Electric field inducing a counter stream against the main flow is formed when the distance from the neighbor electrode is too small in the multiple-electrodes plasma actuator. The counter stream interacts with a downward stream induced by the upstream plasma actuator, which decreases the flow control performance. The interaction between the downward and upward streams is known as the "cross-talk" phenomenon. In this study, we improve the thrust performance in the multiple-electrodes plasma actuator by changing an electrode arrangement to suppress the "cross-talk" phenomenon. The electrode arrangement dependence of the thrust performance is examined by conducting a discharge experiment using multi-electrodes plasma actuator.

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