A flight control through unstable flapping flight[1] MAKOTO IIMA,
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Osaka Prefecture University, KEI SENDA, Kyoto University — We have studied a
flight control in a two-dimensional flapping flight model for insects. In this model,
the model of center-of-mass can move in both horizontal and vertical directions
according to the hydrodynamic force generated by flapping. Under steady flapping,
the model converges to steady flight states depending on initial conditions. We
demonstrate that simple changes in flapping motion, a finite-time stop of flapping,
results in changes in the vortex structures, and the separation of two steady flight
state by a quasi-steady flight. The model's flight finally converges to one of the final
states by way of the quasi-steady state, which is not observed as a (stable) steady
flight. The flight dynamic has been also analyzed.

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