Vertical hovering of a symmetric flapping model MAKOTO IIMA,
TATSUO YANAGITA, Hokkaido University — We study the motion of a model
equipped with flapping wings under the influence of gravity (external force). This
model moves in a two-dimensional fluid according to the hydrodynamic force gen-
erated by vortices separated from its wings. As a result of the interaction between
the vortices and the wings, the model moves steadily in a direction against the grav-
ity. Moreover, hovering, i.e., a steady flight staying in a particular position, can be
achieved here by the effective use of vortex structures enhancing the hydrodynamic
force that supports the model against gravity. The system exhibits a transition
from the state with hovering to a state where hovering is impossible, as the model
parameters are changed.

Makoto Iima
Hokkaido University

Date submitted: 28 Nov 2005   Electronic form version 1.4