

TWO-DIMENSIONAL THEORY OF A FLAPPING WING

AHMAD AHMADIHAGHIGHAT¹ AND HABIB MOLAEI²

^{1,2} Department of Mathematics,
University College of Science & Technology Elm O Fan,
Urmia 57351 33746, Urmia, Iran

E-mail: ahmadahmadihighat@yahoo.com

² University of Technology Ghazi Tabatabaei

P.O.Box 57169 33959, Urmia, Iran

E-mail: Habibmolaei@gmail.com

Abstract

The usual approach is the blade element method that results in expressions for the hydrodynamic force depending on different averages over the wing length. In this work a simpler approach will be adopted: the velocity used to evaluate the force is taken as the wing tip velocity times the square root of non-dimensional second moment of wing area. This is the correct result of blade element theory for a rotating wing at constant angular velocity and fixed angle of attack, and seems to be a reasonable good approximation for the more complex cases considered.