

Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Wing Damage Effects on Dragonfly's maneuverability¹ ZHE NING, KUO GAI, SAMANE ZEYGHAMI, HAIBO DONG, Wright State University, FLOW SIMULATION RESEARCH GROUP (FSRG) TEAM — In this work, how the insect flight behavior contributes to its adaptability to limited performance condition is studied through a combined experimental and computational study. High speed photogrammetry is used to collect the data of dragonflies' takeoffs with intact and damaged wings along the chord and span separately. Then the effect of the spanwise and chordwise damage on the dragonfly wing is investigated. Results show that both changes have different effects on the wing and body kinematics and the merit of maneuverability. Two theories will be introduced to explain the wing damage tolerance behavior of the dragonfly flight.

¹This work is supported by NSF CBET-1055949.

Zhe Ning
Wright State University

Date submitted: 15 Aug 2011

Electronic form version 1.4