

Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

Direct visualization of internal respiratory and food transport dynamics in insects WAH-KEAT LEE, JOHN SOCHA, Argonne National Laboratory, MARK WESTNEAT, Field Museum of Natural History, JON HARRISON, Arizona State University, JAMES WATERS — Although the internal physiological dynamics of large species, especially humans, are well understood, this is not true for small millimeter-sized animals such as insects. Because of their size and in general, optically opaque exteriors, direct visualization of internal insect physiology has not been possible. As such, biologists have relied on indirect techniques, such as gas exchange or pressure measurements, coupled with histology/dissection, and external observations to infer internal dynamics. A new technique, x-ray phase-contrast imaging, have, for the first time, allowed direct visualization of the internal dynamics related to insect physiology. Compression of air sacs and trachea, and the uptake and transport of food in insects have been seen for the first time. These measurements have raised many questions and call for further theoretical research into these complex systems.

Wah-Keat Lee
Argonne National Laboratory

Date submitted: 13 Jul 2007

Electronic form version 1.4