Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

On The Symmetry of Proper Orthogonal Decomposition Modes of a Flapping Foil ZONGXIAN LIANG, HAIBO DONG, Wright State University — In this work, the proper orthogonal decomposition (POD) is applied to investigate the flow field generated by a finite-aspect-ratio flapping foil undergoing a pitching and plunging motion. It is found that geometrical symmetry of the flow field caused by geometrical symmetry of the foil can be preserved by spatial symmetry of POD modes, meanwhile a half-period symmetry caused by symmetric motion of the foil classifies the POD modes into two sets of symmetry patterns with respect to their frequencies. Relations between the symmetry patterns and the direction of aerodynamic forces are discussed.

Zongxian Liang
Wright State University

Date submitted: 03 Aug 2012 Electronic form version 1.4