

Abstract Submitted  
for the DFD16 Meeting of  
The American Physical Society

**Flow-induced oscillations of a floating moored cylinder**<sup>1</sup> DANIEL CARLSON, YAHYA MODARRES-SADEGHI, Univ of Mass - Amherst — An experimental study of flow-induced oscillations of a floating model spar buoy was conducted. The model spar consisted of a floating uniform cylinder moored in a water tunnel test section, and free to oscillate about its mooring attachment point near the center of mass. For the bare cylinder, counter-clockwise (CCW) figure-eight trajectories approaching  $A^*=1$  in amplitude were observed at the lower part of the spar for a reduced velocity range of  $U^*=4-11$ , while its upper part experienced clockwise (CW) orbits. It was hypothesized that the portion of the spar undergoing CCW figure eights is the portion within which the flow excites the structure. By adding helical strakes to the portion of the cylinder with CCW figure eights, the response amplitude was significantly reduced, while adding strakes to portions with clockwise orbital motion had a minimal influence on the amplitude of response.

<sup>1</sup>This work is partially supported by the NSF-sponsored IGERT: Offshore Wind Energy Engineering, Environmental Science, and Policy (Grant Number 1068864).

Daniel Carlson  
Univ of Mass - Amherst

Date submitted: 29 Jul 2016

Electronic form version 1.4