Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Model Scaling of Hydrokinetic Ocean Renewable Energy Systems[1] KARL VON ELLENRIEDER, WILLIAM VALENTINE, Florida Atlantic University — Numerical simulations are performed to validate a non-dimensional dynamic scaling procedure that can be applied to subsurface and deeply moored systems, such as hydrokinetic ocean renewable energy devices. The prototype systems are moored in water 400 m deep and include: subsurface spherical buoys moored in a shear current and excited by waves; an ocean current turbine excited by waves; and a deeply submerged spherical buoy in a shear current excited by strong current fluctuations. The corresponding model systems, which are scaled based on relative water depths of 10 m and 40 m, are also studied. For each case examined, the response of the model system closely matches the scaled response of the corresponding full-sized prototype system. The results suggest that laboratory-scale testing of complete ocean current renewable energy systems moored in a current is possible.

[1]This work was supported by the U.S. Southeast National Marine Renewable Energy Center (SNMREC)

Karl von Ellenrieder
Florida Atlantic University

Date submitted: 28 Jul 2013 Electronic form version 1.4