Abstract Submitted
for the NMC16 Meeting of
The American Physical Society

Capacitive Property of Phosphatic Clay-Diatom Medley[1] DIEFF VITAL, DALTON REITH, CHRISTOPHER COUGHLIN, RYAN INTEGLIA, SESHA SRINIVASAN, BRIAN BIRKY, GARY ALBARELLI, PAUL DEFINO, Florida Polytechnic University, SARAH A SPAULDING, University of Colorado, MELBA D. HORTON, Florida Polytechnic University — Previous reports have shown that about 10000 acres of land in Florida are covered with phosphatic clay. Most of these are found in Polk County with no apparent agricultural use due to its poor quality. Nonetheless, recent laboratory experimentation has shown clay materials with high capacitance and temperature resistance for potential industrial applications. Diatoms are microscopic algae with transparent cell walls made of amorphous silica. This study aims to investigate the electrical properties of phosphatic clay and how its capacitance is mediated by the addition of diatoms with a view towards sustainable energy utilization. Phosphatic clay obtained from settling areas of Polk County was weighed and mixed with the diatom, *Aulacoseira* in a 90:10 ratio. The mixture was homogenized and oven-dried at 210C. Consequently, the dried sample was pelletized and the top and bottom surfaces coated with silver paint. Three pellets were prepared as replicates and the capacitance was measured using a Handheld LCR Meter. Results showed that at 100Hz, the average capacitance of 5g of clay pressed at 8000psi is 27.33nF and 29.33nF the clay is mixed with diatoms. When the weight was cut by half, the average capacitances are respectively 46.67nF and 48.24nF for the same frequency and pressure. Thus, the addition of diatoms appears to enhance the capacitive property of phosphatic clay.

[1]Florida Polytechnic University,Florida Industrial and Phosphate Research Institute, and Mosaic-Saint Fort Meade

Dieff Vital
Florida Polytechnic University

Date submitted: 14 Sep 2016 Electronic form version 1.4