

Abstract Submitted  
for the DFD14 Meeting of  
The American Physical Society

**Electrical Power Generation by Mechanically Modulating Electrical Double Layers**<sup>1</sup> HYUK KYU PAK, JONG KYUN MOON, Ulsan National Institute of Science and Technology, Korea — Since Michael Faraday and Joseph Henry made their great discovery of electromagnetic induction, there have been continuous developments in electrical power generation. Most people today get electricity from thermal, hydroelectric, or nuclear power generation systems, which use this electromagnetic induction phenomenon. Here we propose a new method for electrical power generation, without using electromagnetic induction, by mechanically modulating the electrical double layers at the interfacial areas of a water bridge between two conducting plates. We find that when the height of the water bridge is mechanically modulated, the electrical double layer capacitors formed on the two interfacial areas are continuously charged and discharged at different phases from each other, thus generating an AC electric current across the plates. We use a resistor-capacitor circuit model to explain the results of this experiment[1]. This observation could be useful for constructing a micro-fluidic power generation system and for understanding the interfacial charge distribution in solid-liquid interfaces in the near future.

[1] J. K. Moon, J. Jeong, D. Lee, and H. K. Pak, Nature Communications, 4,1487 doi: 10.1038/ncomms2485

<sup>1</sup>This work was supported by Center for Soft and Living Matter through IBS program in Korea.

Hyuk Kyu Pak  
Ulsan National Institute of Science and Technology

Date submitted: 30 Jul 2014

Electronic form version 1.4