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**Reverse electrowetting – a new approach to high-power harvesting of mechanical energy** TOM KRUPENKIN, J. ASHLEY TAYLOR, SUPONE MANAKASETTHARN, University Wisconsin - Madison — Over the last decade electrical batteries have emerged as a critical bottleneck in portable electronics development. High-power mechanical energy harvesting can potentially provide a valuable alternative to the use of batteries, but until now, its adoption has been hampered by the lack of an efficient mechanical-to-electrical energy conversion technology. In this talk a novel mechanical-to-electrical energy conversion method is discussed. The method is based on reverse electrowetting (REWOD) – a novel microfluidic phenomenon. Electrical energy generation is achieved through the interaction of arrays of moving microscopic liquid droplets with novel nanometer-thick multilayer dielectric films. Advantages of this process include the production of high power densities, up to 1 KW sq. m; the ability to directly utilize a very broad range of mechanical forces and displacements; and the ability to directly output a broad range of currents and voltages, from several volts to tens of volts. We hope that the REWOD-based energy harvesting can provide a novel technology platform for a broad range of new electronic products and enable reduction of cost, pollution, and other problems associated with the wide-spread battery use.

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