

## The Mercury Microswitch:

A Novel MEMS Device with Potential Applications to Space Electronics"

R. Timothy Edwards

Johns Hopkins University/Applied Physics Laboratory

C.-J. Kim

University of California, Los Angeles

Reprogrammable circuits make spacecraft hardware both cheaper and faster to develop. Transistor switches are a speed and performance bottleneck, however, and prevent practical implementation of reprogrammable analog circuits. In collaboration with a lab at UCLA, We are investigating a novel MEMS (microelectromechanical systems) technology that allows the fabrication of arrays of micron-sized mercury droplets on top of circuits fabricated with a standard process. The droplets are miniature switches, but unlike usual mercury switches they are unaffected by gravity but may be moved from side to side by an applied voltage. The properties of electrostatic switching, chatterless contacting, stability in any position, and low contact resistance make this an almost ideal circuit element. Potential applications include field-programmable analog arrays, reconfigurable antennae, and evolvable hardware.