Electrical Actuation of Droplets for Microelectronics Cooling
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**Objective**

Develop technologies enabling electrical actuation and control of droplets for providing chip-integrated thermal management solutions

**Approaches**

• Electrowetting (electrical control of surface tension) based actuation of electrically conducting droplets
• Electric field-based actuation of dielectric droplets
• Experimental characterization of droplet flow and heat transfer
• Electrically tunable thermal resistance switch through control of droplet states on artificially roughened surfaces

**Advantages**

• Significantly enhanced control of flow at the microscale
• High liquid velocities at low voltages
• Noiseless, very low power consumption
• Solutions for chip-level and hot-spot thermal management

**Publications**

- Patent application filed May 2006, #60/747,980