

## Electrowetting of a droplet under AC electric fields

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Electrowetting is prevailing for its various applicability on lap-on-a-chip, and MEMS devices, such as a pump, lens, micro-actuator in the micro-TAS technology. In the usual electrowetting, an AC power is preferred to DC practically. The AC electric field delays the contact angle-saturation, decreases the hysteresis, and is more stable in the view point of dielectric strength. But researches for AC electric field on electrowetting have not been reported very much yet. The different effect of AC on the electrowetting system, especially the effect of a frequency needs to be understood more concretely. In this work, the usual system for electrowetting, water droplet on the dielectric coated electrode (EWOD) is analyzed. Experimental study on the response of contact angles on input frequencies is performed. The simple circuit-model for EWOD system is considered to explain the experimental results. For more concrete understanding, the system is analyzed numerically, where simple AC-conduction model is used. Wetting tensions are analyzed under various input frequency to excavate the experimental results for the responses of the system on input frequencies. This work was supported by the grant from CUPS and KOSEF