Droplet dispensing on dielectric substrate by electric induction

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Dispensing of droplets with higher resolution provides further opportunities in many applications such as microarray, cell cultures, printed-electronics, etc. In this study, the electric charge concentration(ECC) method for droplet generation on the dielectric substrate with high resolution was adopted. In ECC method, the droplet is dispensed by the electric attraction between the droplet surface and the induced counter charges accumulated on the surface of the target substrate. First, the feasibility of ECC method for dispensing droplets was confirmed experimentally. For comprehension of relationship between the size of droplets and parameters, experiments have been carried out by changing the parameters such as spacing, electric potential and electric permittivity which can affect to the size of droplets. The micro-array was demonstrated by ECC method and the dispensing procedure was studied by numerical simulation based on OpenFOAM.