

## HARVESTING ENERGY FROM WATER DROPLET BASED ON CHARGE TRAPPING AT HYDROPHOBIC POLYMER SURFACES

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Natural water motion provides a renewable energy, which we could use but haven't successfully harvested. In this work, we present a novel water droplet energy harvesting technology based on the charge trapping in fluoropolymer films. We find that charges can be spontaneously trapped at fluoropolymer/water interfaces and this phenomenon is enhanced by applying an electric fields. We quantify the trapped charge density and its life time by using electrowetting. When a droplet impact the polymer surfaces with trapping charges, to compensate the trapping charges on the polymer surfaces, the counter charges will migrate between the bottom electrode and the liquid/solid interfaces. In such a way, a current is generated due to the motion of water droplet. The first charge trapping based water energy harvester from rain droplet will be shown. The generated current/voltage/power are found affected by the parameters such as the load resistance and the liquid conductivity. This energy harvesting method can be applied toward not only water droplets, but also other types of moving water contact lines, as encountered e.g. in ocean waves.