

## **Contact Line Dynamics during Evaporation of Nanodroplets Sessile on Soft Substrates**

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The evaporation of nano-droplets sessile on soft solid substrates was investigated using molecular dynamics (MD) simulations. When a droplet is placed on a soft and flexible substrate, the substrate would deform and a ridge appears along the contact line, which is induced by the vertical component of liquid–vapor interfacial tension. Influence of substrate elasticity on the contact line dynamics was discussed. Our simulation results show that the ridge height is dependent on the droplet size and the rigidity of the substrate. During the evaporation, the contact line recedes and the wetting ridge follows. The substrate deformation plays a significant role on the contact line motion. Our findings shed light on fundamental mechanisms of the dynamics of the contact line on soft substrate at the nanoscale.

**Keywords:** Evaporation, Soft substrate, Nanodroplet, Molecular dynamics