

Cloaking Induced Variation in Droplet Surface Tension

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Cloaking of surface material (e.g. oligomers in PDMS coatings) on contacting droplets is a phenomenon that directly affects static and dynamic wetting. Of the multitude of changes that the system undergoes with cloaking, the change in the effective droplet surface tension is the most conspicuous. The small length scale of the cloak (in the order of nanometers) together with the imposed curvature of the droplet surface makes direct experimental monitoring (static and dynamic) challenging. Here, we tackle this problem with a combination of MD simulations and surface tension measurements. The former resolves locally the degree of the cloak while the latter resolves the temporal evolution of the cloak using the surface tension as a proxy. The analysis is finally supplemented with a theoretical framework, motivated by the results.

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