

Abstract Submitted
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Statistical analysis of Contact Angle Hysteresis NACHIKETA JANARDAN, MAHESH PANCHAGNULA, IIT Madras — We present the results of a new statistical approach to determining Contact Angle Hysteresis (CAH) by studying the nature of the triple line. A statistical distribution of local contact angles on a random three-dimensional drop is used as the basis for this approach. Drops with randomly shaped triple lines but of fixed volumes were deposited on a substrate and their triple line shapes were extracted by imaging. Using a solution developed by Prabhala et al. (Langmuir, 2010), the complete three dimensional shape of the sessile drop was generated. A distribution of the local contact angles for several such drops but of the same liquid-substrate pairs is generated. This distribution is a result of several microscopic advancing and receding processes along the triple line. This distribution is used to yield an approximation of the CAH associated with the substrate. This is then compared with measurements of CAH by means of a liquid infusion-withdrawal experiment. Static measurements are shown to be sufficient to measure quasistatic contact angle hysteresis of a substrate. The approach also points towards the relationship between microscopic triple line contortions and CAH.

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