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Fluctuations of interfacial forces near a moving contact line¹ YONGJIAN WANG, SHUO GUO, PING SHENG, PENGER TONG, Department of Physics, Hong Kong University of Science and Technology — Atomic force microscope (AFM) is used as a force sensor to measure the capillary forces on a long vertical glass fiber with one end glued onto a rectangular shaped cantilever beam and the other end immersed through a liquid-air interface. Using a cleaned glass fiber of ~ 2μ m in diameter, we were able to determine the surface tension of a class of liquids with good accuracy. For this class of liquids, no detectable hysteresis is found when the contact line between the liquid and glass fiber moves at a constant speed. The AFM force measurements, however, revealed considerable fluctuations in the force amplitude. The probability density function of the force fluctuations all shows a Gaussian form. Investigations are carried out to find the relationship between the mean squared value of force fluctuations and the chemical properties of the liquid.

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