The role of convective acceleration in determining the velocity and dynamic angle at the contact line[1] JOSEPH THALAKKOTTOR, KAMRAN MOHSENI, Univ of Florida - Gainesville — The major challenges associated with the moving contact line problem are in determining the velocity and the dynamic contact angle at the contact line. Our theoretical and numerical studies show that the key factor common to both is the role of convective acceleration in the vicinity of the moving contact line. We present our unified slip boundary condition, which demonstrates that slip velocity near a contact line is not just dependent on shear rate, but also on linear strain rate. Also, we present a microscopic dynamic contact angle model that shows dependency not only on surface tensions of respective interfaces, but also on their gradients. The presence of both the linear strain rate and surface tension gradient in the vicinity of the contact line is attributed to convective acceleration.

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