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How long does it take for sessile droplets to evaporate? STEPHEN WILSON[1], JUTTA STAUBER, BRIAN DUFFY, University of Strathclyde, KHELLIL SEFIANE, University of Edinburgh — The evaporation of sessile droplets plays a crucial part in many practical applications, and in many of these applications it is important to be able to understand and/or control the lifetimes of droplets. The lifetime of an evaporating droplet depends on the manner in which it evaporates. There are various qualitatively different modes of droplet evaporation, of which the most extreme are the constant radius mode (in which the contact line is always pinned) and the constant angle mode (in which the contact angle θ always takes its initial value $\theta = \theta_0$), and probably the most commonly occurring is the stick-slide mode (in which the drop initially evaporates in a constant radius phase until θ reaches a critical transition angle θ^*, and thereafter evaporates in a constant angle phase with $\theta = \theta^*$). In this talk we describe a theoretical model for the stick-slide mode and discuss the relationship between θ_0 and θ^* and its implications. Theoretical predictions for the lifetimes of droplets are compared with previously published experimental results. Further details of the theoretical model are given in the recent paper by Stauber, Wilson, Duffy and Sefiane [*J. Fluid Mech.* **744**, R2 (2014)].

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