

Abstract Submitted
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Convective rolls and hydrothermal waves in evaporating sessile drops¹ GEORGE KARAPETSAS, Imperial College London, PRASHANT VAL-LURI, KHELLIL SEFIANE, University of Edinburgh, OMAR MATAR, Imperial College London — We examine the dynamics of a sessile droplet sitting on a uniformly heated solid, undergoing evaporation. We use a finite element formulation to solve the axisymmetric time-dependent problem and perform a linear stability analysis taking into account 3D perturbations around this base-state. Our numerical results show that the temperature gradients, which are a natural consequence of the evaporation process, give rise to instabilities including the presence of hydrothermal waves in close agreement with previous experimental observation. We discuss the mechanisms which give rise to these instabilities.

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