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**Dynamics of evaporating sessile droplets**[1] PEDRO SÁENZ, PRASHANT VALLURI, KHELLIL SEFIANE, University of Edinburgh, GEORGE KARAPETSAS, University of Thessaly, JUNGHO KIM, University of Maryland, College Park, OMAR MATAR, Imperial College London — A sessile droplet laying on a horizontal substrate evaporates into its surrounding gas. The dynamics of this physical system are investigated by means of 3D Direct Numerical Simulations and experiments. A non-isothermal two-phase model is employed to compute the spatio-temporal evolution of the system under consideration. Transient species transport in the gas phase is also accounted for via the general advection-diffusion governing equation. The interface mass transfer is computed considering that the vapour diffusion is the rate-limiting mechanism. On this premise, it is assumed that the liquid and the gas maintain thermodynamic quasi-equilibrium at the interface. The same system is also experimentally investigated by simultaneously recording the droplet evaporation in a controlled environment with a CCD camera (side) and an IR camera (top). Comparisons between numerical and experimental data are presented along with a discussion of the role played by other singularities of the system, namely the triple line, the effect of thermocapillarity, etc.

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