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Evaporation dynamics of ethanol drops under terrestrial and reduced gravity levels[1] FLORIAN CARLE, BENJAMIN SOBAC, DAVID BRUTIN, Aix-Marseille University - UMR 7343 IUSTI Laboratory — This experimental study, performed under microgravity conditions, focuses on the evaporation dynamics of ethanol drops and the formation and behaviour of the hydrothermal waves (HTWs) that spontaneously develop on the drops' surfaces. The aim of this study is to compare our results to a similar study performed under normal gravity conditions to confirm the purely thermocapillary origin of these instabilities. Under normal gravity conditions, a temperature gradient develops during the evaporation from the apex of the drop and the contact line, resulting in a gradient of surface tension, generating instabilities. HTWs flow radially around the apex where most of the evaporation takes place. In microgravity, the temperature gradient isn't as much defined as the one in normal gravity, but the apex maintains a temperature below the one of triple line. For different substrate temperatures and different levels of gravity, the HTWs follow a power law decay of the number of instabilities. Microgravity experiments show the same power law evolution. A scaling law succeed to predict with a good agreement the number of instabilities that form, regardless of the drop diameters, the substrate temperatures and the gravity levels.

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