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Experimental results on evaporation waves[1] JOSE GRANA OTERO, IGNACIO PARRA FABIAN, School of Aeronautics (UPM) — A liquid contained in a vertical glass tube is suddenly depressurized from a high initial pressure down to one for which the stable state is vapour, so vaporization sets off at the free surface. For large enough evaporation rates, the planar vapour-liquid interface is Darrieus-Landau unstable [1], leading to the interface surface rippling close to the instability threshold. Further increasing the initial to final pressure ratio brings about evaporation waves [2,3], in which a highly corrugated front propagates downwards into the liquid. A new experimental method is presented as well as some experimental results obtained by tracking the evolution of the front with a high speed camera. In addition, a number of new phenomena related to the dynamics of bubbles growth at the walls has been uncovered. In particular, a new mode of propagation of the evaporation front is found. In this mode the front originates from below the interface, so the propagation is upwards against gravity with a curved but smooth front.

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