**Ligament breakup without surface tension**

LIONEL VINCENT, LAURENT DUCHEMIN, STÉPHANE LE DIZÉS, EMMANUEL VILLERMAUX, Aix Marseille Université, IRPHE, Marseille, France — We study the breakup of an axisymmetric low viscosity liquid volume (ethanol and water), held by surface tension on supporting rods, when subject to a violent axial stretching. One of the rods is promptly set into a fast motion, either with constant acceleration, or constant velocity. In both cases, a thin ligament is withdrawn from the initial liquid volume, which eventually breaks-up at time $t_b$, leaving a liquid mass $m$ attached to the moving rod. We find that the breakup time and entrained mass are related by $t_b \sim \sqrt{m/\sigma}$, where $\sigma$ is the liquid surface tension. For a constant acceleration $\gamma$, and although the overall process is driven by surface tension, $t_b$ is surprisingly found to be independent of $\sigma$, while $m$ is inversely proportional to $\gamma$. The case with constant velocity will be considered too.

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Date submitted: 26 Jul 2013

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