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Dripping under an inclined plane NICOLAS KOFMAN, FRANCOIS GALLAIRE, LFMI EPFL, Lausanne, Switzerland, BENOIT SCHEID, TIPs ULB, Bruxelles, Belgium — A liquid film flowing above an inclined plane can be unstable due to inertial effects : this instability, first studied by Kapitza in 1948, is always of convective nature. When the plane is reversed, there is also a destabilizing effect of gravity and the system exhibits a transition from convective to absolute instabilty as shown recently by Brun and coworkers using a lubrication equation. In addition, the latter authors observed experimentally that this transition corresponds roughly to the limit of dripping. We investigate further this idea numerically by using a more sophisticated set of equations including inertia and second-order viscous terms (Ruyer-Quil-Manneville model). When getting closer to horizontality, 2D stationary wave profiles computed by continuation exhibit a transition from Kapitza-like waves to more symmetric drop profiles riding on a thinner substrate. Their 2D/3D secondary modes of instability are anaylzed using a Floquet linear stability analysis and compared with time simulations of the equations model.

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