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Hydrodynamic Theory of De-Wetting

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A prototypical problem in the study of wetting phenomena is that of a solid plunging into or being withdrawn from a liquid bath. In the latter, de-wetting case, a critical speed exists above which a stationary contact line is no longer sustainable and a liquid film is being deposited on the solid. Demonstrating this behavior to be a hydrodynamic instability close to the contact line, we provide the first theoretical explanation of a classical prediction due to Derjaguin and Levi: instability occurs when the outer, static meniscus approaches the shape corresponding to a perfectly wetting fluid.

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