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The first contact of a droplet impacting a dry solid surface S.T. THORODDSEN, E.Q. LI, I.U. VAKARELSKI, King Abdullah University of Science and Technology — The first contact of a drop hitting a dry solid surface, does not occur at a point but along a ring, owing to viscous lubrication pressure in the intervening air layer. This always leads to the entrapment of a small bubble under the center of the drop. The nature of the actual first contact is affected by the roughness of the solid. We use ultra-high-speed imaging, with 200 ns time resolution, to observe the structure of this first contact between the liquid and a smooth solid surface. For a water drop impacting onto regular micro-scope glass slide we observe a ring of micro-bubbles as observed by Thoroddsen et al.[1] which conveniently marks the original diameter of the air-disc. This ring of bubbles arises owing to multiple initial contacts just before the formation of the fully wetted outer section. These contacts are spaced by a few microns and quickly grow in size until they meet each other, entrapping the bubbles. We thereby conclude that the localized contacts are due to nanometric roughness of the glass surface and the presence of the micro-bubbles can therefore distinguish between glass with 10 nm roughness from perfectly smooth glass.

[1]Thoroddsen et al., The air-bubble entrapped under a drop impacting on a solid surface. *J. Fluid Mech.*,**545**, 203-212.

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