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On the evolution of a retracting straight liquid sheet edge: experimental study ROUSLAN KRECHETNIKOV, HANS C. MAYER, University of California at Santa Barbara — The evolution of the initially straight edge of a retracting liquid sheet is still a subject of debate. Theoretical and numerical studies have provided conflicting results, and experimental efforts have, to our knowledge, never been attempted owing to the difficulty in achieving a uniform edge. However, recent advances in experimental techniques, specifically those presented in detail in Poster #72 of APS-DFD 2010 (H.C. Mayer and R. Krechetnikov), have allowed us to uniformly detach a soap film from a straight edge using an impulsively heated wire frame. The detachment, retraction, and breakup of soap films (h $\sim$ 10 μm) is analyzed using high speed photography. Owing to the Plateau border that connects the uniform film to the wire frames (wire diameter 25-250 μm) - a feature not present when rupturing films from a point - the early stages of retraction are dominated by a relatively large rim mass. We explore the phenomena at very early times (t $<$ 100 μs) associated with the birth of these detached films which may add complexity to the problem of determining what instability mechanism(s) are responsible for their breakup.

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