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The breakup of thin air films caught under impacting drops SIGURDUR THORODDSEN, MARIE-JEAN THORAVAL, King Abdullah University of Science and Technology, Saudi Arabia, KOHSEI TAKEHARA, T. GOJI ETOH, Kinki University, Japan — When a drop impacts a pool at very low velocities V, an air layer cushions the impact and prevents immediate contact. This air layer is stretched into a hemispheric shape and thins to a submicron thickness. We use silicone oils, where these films are more stable than for water [Saylor & Bounds (2012), *AIChE J.*, online: *doi 10.1002/aic.13764*]. We observe three main breakup mechanisms which are imprinted onto the micro-bubble morphology. First, for lowest V the film ruptures at isolated holes which grow rapidly, leaving *bubble necklaces* where their edges meet. Based on micro-bubble volumes, we show the film breaks by van der Waals, when its thickness $\sim$ 100 nm. Secondly, for slightly larger V a ring of holes appearing a fixed depth, where the film is thinnest, producing *bubble chandeliers*. Finally, for larger V an air jet within the drop, ruptures it at the bottom tip, in an axisymmetric breakup. We measure the rupture speed and find that for very viscous liquids, the breakup moves faster than the capillary-viscous velocity, through the repeated ruptures. [Thoroddsen, Thoraval, Takehara & Etoh (2012), *J. Fluid Mech.* online: *doi:10.1017/jfm.2012.319*].

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