The generation of singular liquid jets in the axisymmetric bubble pinch-off at high Reynolds numbers J.M. GORDILLO, Area de Mecanica de Fluidos, Universidad de Sevilla. ESI, Camino de los descubrimientos, s/n 41092, Spain, A. SEVILLA, J. RODRIGUEZ-RODRIGUEZ, C. MARTINEZ-BAZAN, M. PEREZ-SABORID — In this presentation we review the symmetric and asymmetric type of bubble pinch-off local geometries described in PRL, 95, 194501, and provide with the different scalings for the minimum radius, $R_0$, as the singularity is approached. Moreover, in the case of gas inertia is not relevant in the description of the latest stages of bubble breakup (symmetric pinch-off), local bubble shape is given by $F(z,t)/R_0(t) = 1 - [1/(6 \log(R_0))] (z/R_0)^2$. However, we also discuss that the asymptotic solutions for the symmetric case are only reached for times so close to pinch off that they might be difficult to find and, therefore, bubble pinch-off strongly depends on initial conditions. Regarding the asymmetric type of breakup, we provide new experimental evidence that support that, close to pinch-off, gas and liquid inertia are balanced. We will show that the velocity of the singular liquid jets formed within air and helium bubbles generated from a needle immersed in a coaxial co-flow strongly depends on gas density. More precisely, the ratio of the liquid jet velocity formed using air ($u_a$) to the liquid jet velocity formed using helium ($u_h$) is given, for the same operating conditions, by $u_a/u_h \simeq (\rho_{\text{air}}/\rho_{\text{helium}})^{1/n}$, with $2 < n < 3$.

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