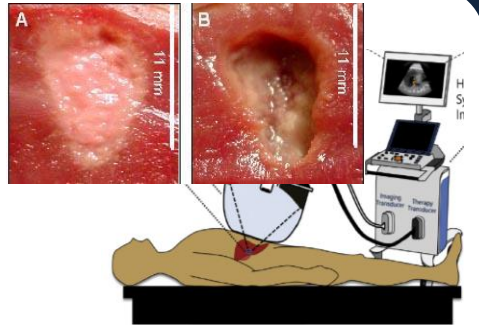


Energy Budgets In Bubble Collapse Near a Rigid Surface

Minki Kim, Shahaboddin Beig, Eric Johnsen (U. Michigan–Ann Arbor, Continuum Dynamics, Inc)



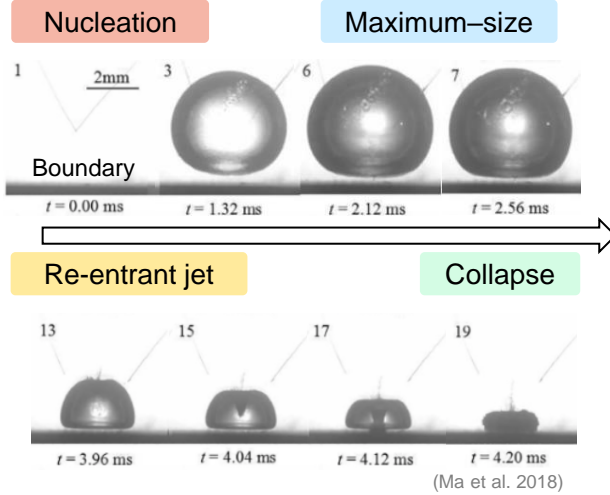
(Kim et al. 2014)



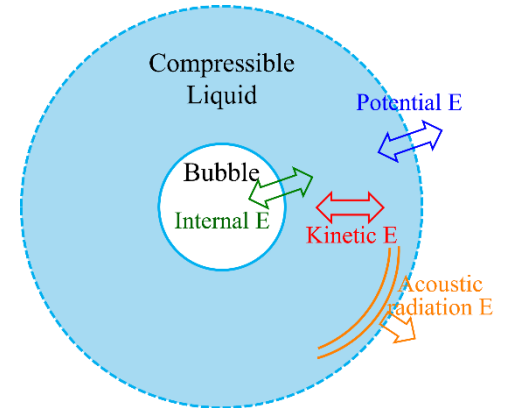
(Parsons et al. 2006; Bader et al. 2019)

Cavitation erosion is problematic in naval hydrodynamic systems but can be exploited in therapeutic ultrasound

Growth & collapse of a bubble

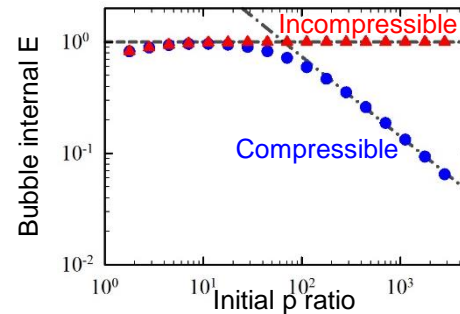
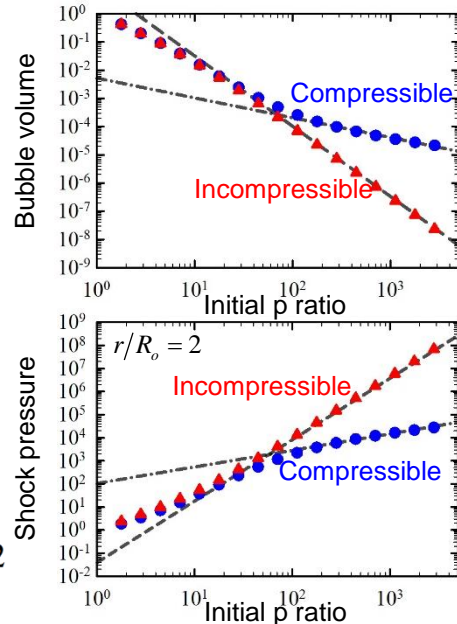
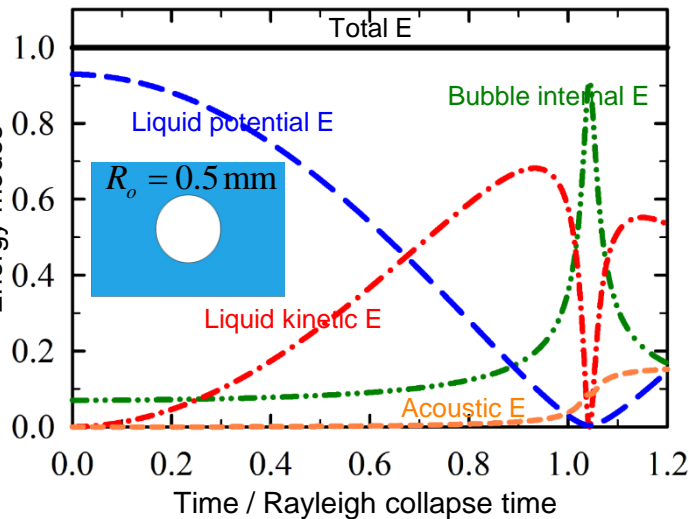


Energy modes in the system



Our objective is to propose the scaling relations to predict the shock pressure

Energy transport & concentration



Energy balance

$$p_{\infty} V_o + \frac{P_g}{k-1} V_o = 2\pi\rho_l R^3 \dot{R}^2 + p_{\infty} V + \frac{P_g}{k-1} V + \int_0^t \frac{\rho_l}{4\pi c_l} \dot{V}(R) \ddot{V}(R) dt$$

Initial energy Liquid energy Bubble energy Acoustic energy

