

Supplementary Material: Radial dynamics of an encapsulated microbubble with interface energy

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The optimized values of interface and material parameters obtained from the optimization problem for various natural configuration outer radii of the encapsulated bubble are tabulated in tables [S.1](#) and [S.2](#), respectively. The tabulated data below has been used to obtain figures 4 and 5 in the main text.

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R_{20}	Interface parameters $\gamma_{ij} (\times 10^{-2})$									
	γ_{11}	γ_{21}	γ_{12}	γ_{22}	γ_{13}	γ_{23}	γ_{14}	γ_{24}	γ_{15}	γ_{25}
0.80	1.00	1.00	1.00	12.00	3.00	1.00	1.00	1.00	7.00	1.00
1.00	1.00	1.00	1.00	1.00	1.01	7.83	1.00	1.00	8.00	1.00
1.30	1.03	1.00	1.00	1.00	3.04	5.95	1.00	1.00	8.00	1.00
1.40	1.00	1.00	1.00	1.00	1.65	4.51	1.00	1.00	8.00	1.00
1.50	1.00	1.00	1.00	1.94	6.71	2.47	1.00	1.00	8.00	1.00
1.60	1.00	1.00	1.00	1.00	4.43	4.57	3.36	1.00	8.00	1.00
1.70	1.10	1.00	1.00	1.00	8.00	4.49	4.49	1.00	8.00	1.00
1.75	1.00	1.00	1.00	1.00	8.00	1.00	1.00	1.00	8.00	1.00
1.80	1.00	1.00	1.00	2.85	8.00	1.00	1.00	1.00	8.00	1.00
1.85	1.00	1.00	1.24	1.00	7.69	1.30	1.00	1.30	8.00	1.00
1.90	1.00	1.00	1.00	1.00	8.00	1.00	1.00	1.00	8.00	1.00
2.00	1.00	1.00	1.00	4.00	8.00	1.00	1.00	1.00	8.00	1.00
2.10	1.00	1.00	1.31	2.33	8.00	1.00	1.00	1.00	8.00	1.00
2.25	1.00	1.00	6.87	4.05	8.00	1.00	1.00	1.00	8.00	1.00
2.40	1.00	1.00	1.00	12.52	8.00	1.00	1.00	1.00	8.00	1.00
2.50	1.00	1.00	1.00	30.75	8.00	1.00	8.00	1.00	8.00	1.00
2.70	1.00	1.00	1.00	30.81	8.00	1.00	1.00	1.00	8.00	1.00
3.00	1.00	1.00	1.13	31.28	8.00	1.00	1.00	1.00	8.00	1.00
3.25	1.00	1.00	6.28	48.12	8.00	1.00	1.00	1.00	8.00	1.00

TABLE S.1. Optimized interface parameters (IP) for encapsulated bubbles with different natural configuration outer radii R_{20} (μm), excitation pressure $p_a = 0.15$ MPa and frequency $f = 2.5$ MHz.

Bulk material parameters							
R_{20}	C_1	C_2	h	η^S	p_{g0}	χ	k^S
0.80	2.60	4.99	7.40	0.07	0.19	0.33	1.55
1.00	4.43	3.06	7.40	0.07	0.18	0.33	1.55
1.30	3.00	4.50	7.50	0.07	0.18	0.33	1.57
1.40	4.49	3.00	7.50	0.07	0.18	0.33	1.57
1.50	3.46	4.32	7.87	0.07	0.19	0.36	1.65
1.60	3.00	4.89	7.50	0.07	0.24	0.35	1.57
1.70	4.73	3.26	7.59	0.08	0.22	0.36	1.70
1.75	3.03	4.46	7.50	0.07	0.24	0.33	1.57
1.80	3.00	4.78	7.20	0.07	0.25	0.33	1.51
1.85	3.08	4.45	7.20	0.07	0.24	0.32	1.56
1.90	3.02	4.47	7.30	0.07	0.24	0.32	1.53
2.00	3.00	4.50	7.40	0.07	0.26	0.33	1.55
2.10	3.00	4.82	7.90	0.07	0.28	0.37	1.66
2.25	3.03	5.00	7.49	0.07	0.30	0.36	1.57
2.40	3.91	4.58	7.50	0.08	0.30	0.38	1.80
2.50	4.50	3.80	7.50	0.08	0.30	0.37	1.80
2.70	5.00	3.45	7.80	0.08	0.31	0.39	1.87
3.00	4.50	3.50	8.10	0.08	0.31	0.38	1.94
3.25	4.50	3.50	8.10	0.08	0.32	0.38	1.93

TABLE S.2. Optimized material parameters (MP) such as shell elastic constants (C_1, C_2) MPa, bubble shell thickness (h) nm, viscosity of shell (η^S) Pa-s, natural configuration pressure (p_{g0}) MPa, shell elasticity modulus (χ) N/m and shell dilatational viscosity (k^S) 10^{-9} kg/s for encapsulated bubbles with different natural configuration outer radii (R_{20}) μm , viscosity of the liquid $\eta^L = 1$ mPa-s, excitation pressure $p_a = 0.15$ MPa and frequency $f = 2.5$ MHz.
