

Supplementary material

Contact geometry and hysteretic damping in the rebound of a billiard ball from a cushion

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S1. The 24 measured shots

The 24 measured shots against which the model is scored, digitised from the rebound figure of Mathavan et al., *Am. J. Phys.* **77**(9), 788–794 (2009), as replotted in *Proc. IMechE Part C* **224**(9), 1863–1873 (2010), Fig. 7(a).

Conditions: perpendicular incidence, rolling ($\omega_{T0} = V_0/R$), no sidespin; snooker ball $M = 0.1406$ kg, $R = 26.25$ mm; Riley Renaissance-type snooker table. Reading error of order 0.020 m s^{-1} .

V_{out} is the speed the tracker reads, not the speed at separation. The two are related by $V_{\text{out}}^2 = V_{\text{sep}}^2 - 2a_cs$, Eq. (12) of the main text, with the calibrated $a_cs = 0.0064 \text{ m}^2 \text{ s}^{-2}$.

Table 1: Incident and tracked rebound speed, m s^{-1} .

V_0	V_{out}	V_0	V_{out}
0.274	0.228	1.305	1.235
0.365	0.317	1.530	1.457
0.430	0.377	1.759	1.648
0.505	0.445	1.995	1.826
0.520	0.498	2.277	2.035
0.645	0.560	2.527	2.285
0.677	0.601	2.699	2.269
0.712	0.660	2.888	2.388
0.830	0.788	2.982	2.469
0.880	0.791	3.102	2.630
1.155	1.089	3.179	2.577
1.160	1.042	3.396	2.742