SM_movie1 Ping pong ball water cannon in reference conditions (see main text fig. 4 for snapshots): Cup mass $m_c = 6.2\,\mathrm{g}$, cup+water mass $M = 150\,\mathrm{g}$, table tennis ball mass $m = 2.84\,\mathrm{g}$, drop height $\zeta = 1.411\,\mathrm{m}$. Scale bar and time code are overlayed on the movie.

SM_movie2 Liquid is 70 % ethanol, other conditions as in SM_movie1, in particular $M = 150\,\mathrm{g}$. The modified wetting conditions on the ball cause its enhanced immersion at the end of the free fall, and a more than threefold ejection velocity.

SM_movie3 Conditions as in SM_movie1, but the water was stirred into rotation before releasing the glass. Note again the more immersed position of the ball just before impact and higher ejection speed, compared to SM_movie1.

SM_movie4 Cup mass $m_c = 15.7\,\mathrm{g}$, cup+water mass $M = 150\,\mathrm{g}$, table tennis ball mass $m = 2.81\,\mathrm{g}$, drop height $\zeta = 1.057\,\mathrm{m}$. Here the glass falls onto a 10 cm thick rubber foam, increasing the duration of its rebound to about 20 ms. Note how the ball is ejected in a fraction of that time. When the glass' velocity becomes zero (corresponding to an overlay time stamp of $t = 0\,\mathrm{ms}$), the ball has already left the liquid entirely. It is subsequently overtaken and engulfed by the Worthington jet, which is accelerated over the whole impact duration. This contrasts with the other movies where ball and jet tip velocities appear to be equal.