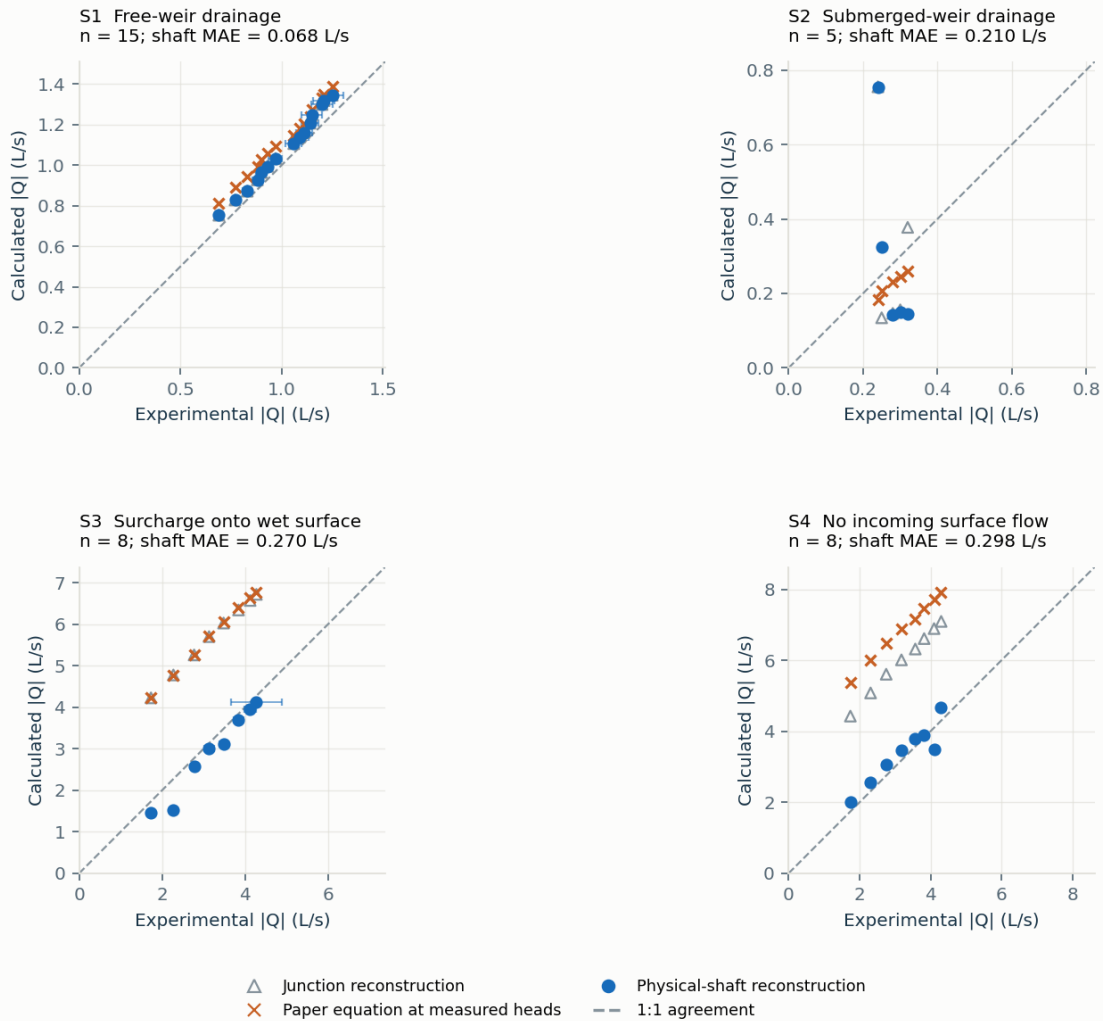


Experimental versus simulated exchange

36 published steady measurements • reconstructed flume • 0.5 s routing step; convergence unresolved

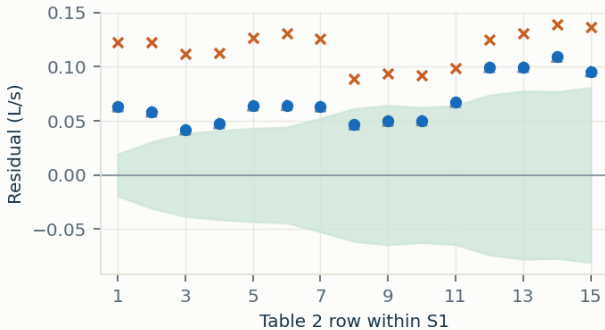


All 36 Table 2 measurements. Horizontal bars show the published $x_{i,f}$ variation. Axes use different scales between regimes; each panel has equal x and y scales. Paper equations use measured heads; routed models evolve their heads. The physical-shaft results use a 0.5 s routing step and are not converged.

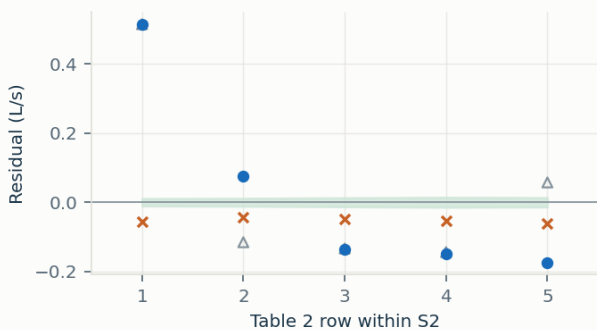
Where the exchange predictions differ

Residual = calculated magnitude – experimental magnitude • same 36 steady rows; no coefficient retuning

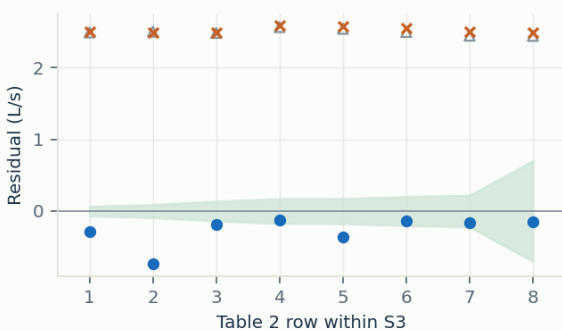
S1 Free-weir drainage
Shaft: 3/15 within illustrative band



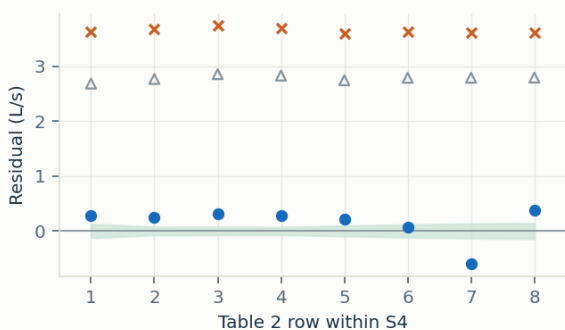
S2 Submerged-weir drainage
Shaft: 0/5 within illustrative band



S3 Surcharge onto wet surface
Shaft: 4/8 within illustrative band



S4 No incoming surface flow
Shaft: 1/8 within illustrative band



△ Junction reconstruction
● Physical-shaft reconstruction
× Paper equation at measured heads
±(ξf + 2% of measurement); not a confidence interval

Residuals use discharge magnitudes. Green shading is the illustrative band $\pm(\xi_f + 2\%$ of measurement), not a statistical confidence interval. Only 8/36 physical-shaft rates meet it. Row numbers restart within each regime.

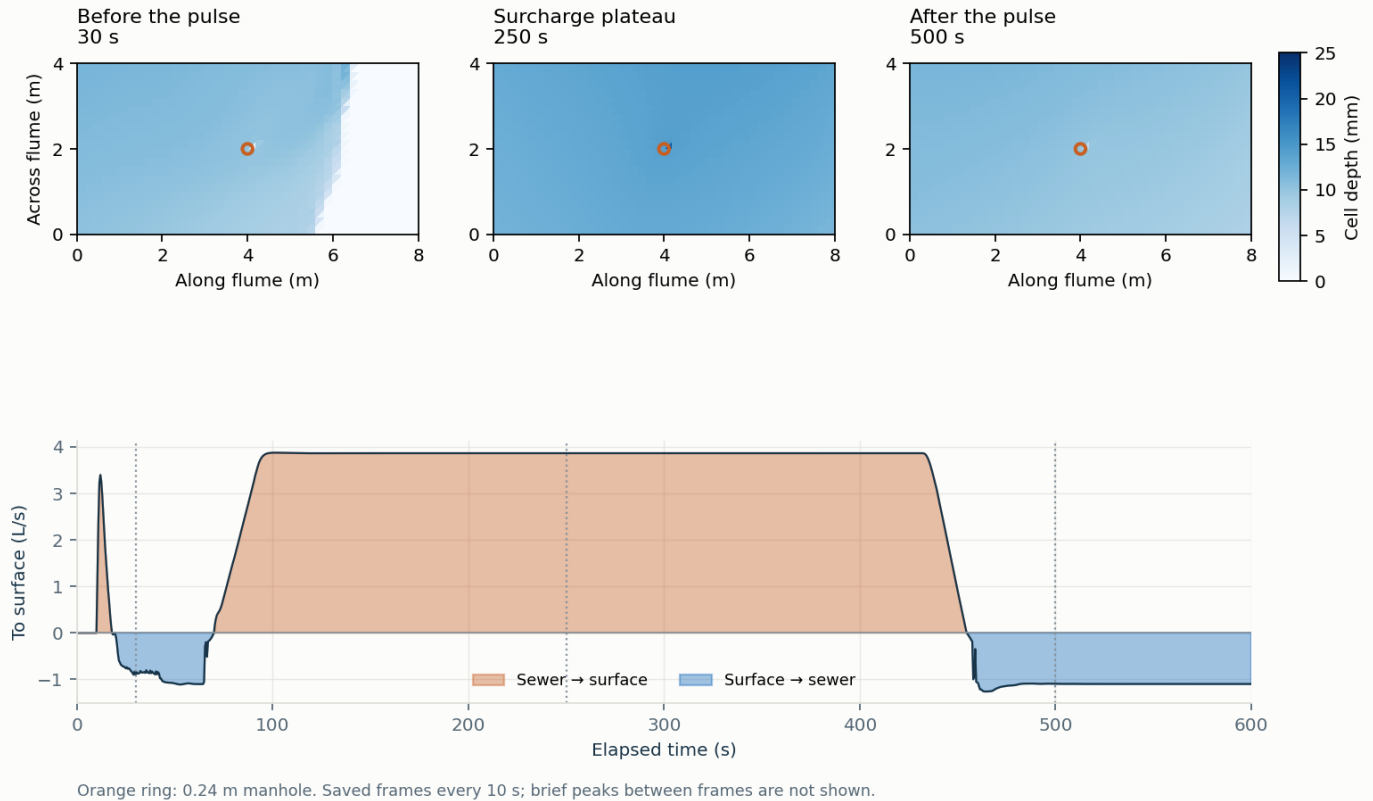


One case per regime, selected by largest coarse-step window drift. Green lines and bands show the signed measured discharge and ξ_f . Blue points are the late-window means. Positive is sewer to surface. Two steps do not establish convergence.

Follow surcharge and drainback across the flume

Synthetic T9 • actual saved cell depths on 1,600 triangles • constant colour scale • no experimental transient series

Gross spill 1.415 m³ Gross drainback 0.201 m³ Net to surface 1.214 m³



Synthetic T9 only; no measured transient curve. Surface maps use actual saved cell depths with a fixed 0-25 mm scale. The orange ring is the manhole. Frames are spaced 10 s apart and omit brief between-frame peaks. Surface inflow continues throughout the run; the map is not surcharge water alone.