

# Observations of large-scale coherent structures in gravity currents: implications for flow dynamics

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## Supplementary Material

Extension to figures from the manuscript showing data from the  $Q = 0.18 \text{ L s}^{-1}$  case, which was excluded from the main text but is here included for completeness. This exclusion was a result of the lower data quality stemming largely from an increase in experimental noise, likely a result of imperfect refractive index matching, leading to a significantly higher proportion of spurious vectors compared with the other cases presented.

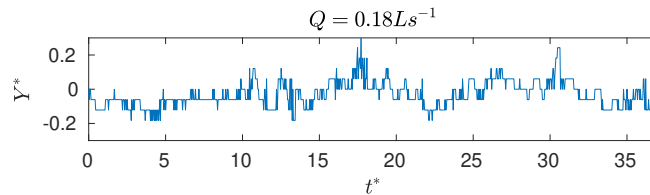
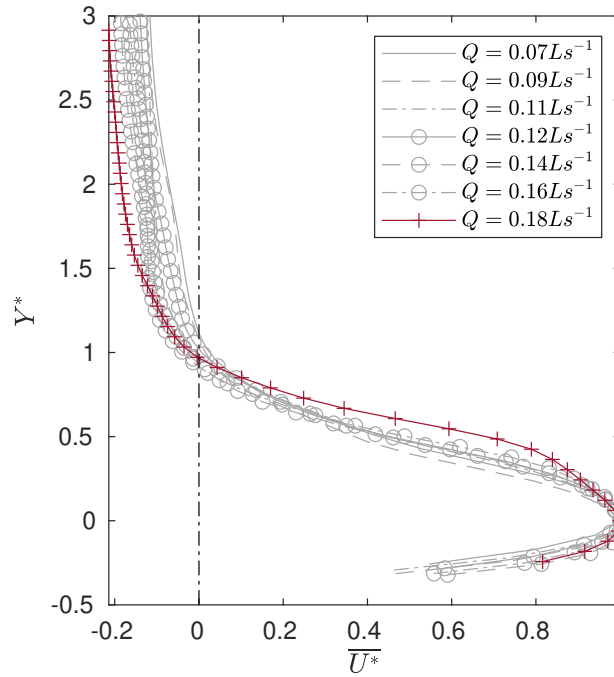


Figure S1: Supplement to Figure 3, the height of the velocity maximum over time at a central downstream location ( $\approx 1.5 \text{ m}$  from the inlet) for the body data for the  $Q = 0.18 \text{ L s}^{-1}$  case, where the body data are defined as in the manuscript.



(a)

Figure S2: Supplement to Figure 4(a), the normalised downstream velocity averaged over all downstream locations and 10s body time steps for the case with  $Q = 0.18 Ls^{-1}$  (where body data are defined by measuring the time taken for the current front to cross the measurement region and then waiting that time again before including data).

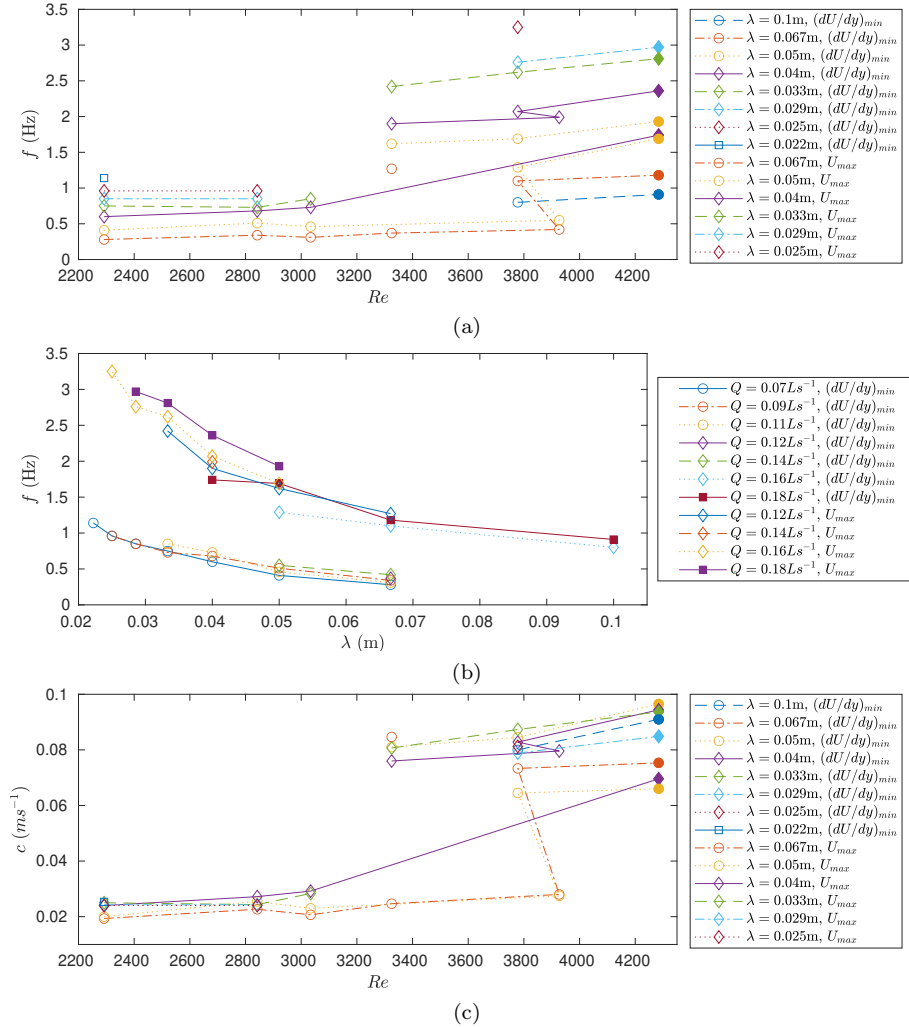


Figure S3: Supplement to Figure 11, plots tracking similar modes showing (a) modes with a particular frequency tracked across each influx investigated, with the frequency of the mode plotted as a function of  $Re$ , (b) mode wavelength plotted against frequency as a function of influx and mode location, and (c) modes with a particular frequency tracked across each influx investigated, with the phase speed of the mode plotted as a function of  $Re$ . Data points additional to the main manuscript are indicated using filled markers.

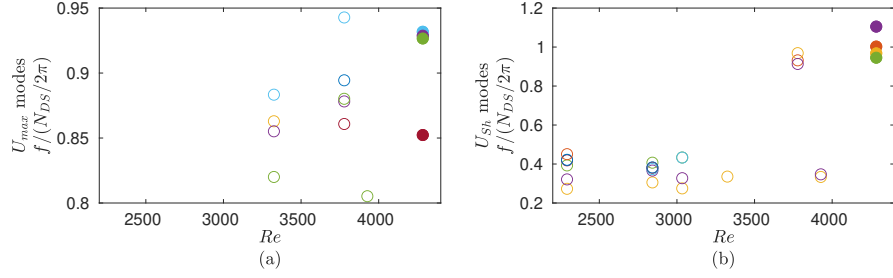


Figure S4: Supplement to Figure 12, scatter plots of the observed mode frequencies divided by the expected buoyancy frequency Doppler shifted by the mean flow at the estimated wave height for (a) modes at the velocity maximum and (b) modes above the velocity maximum. Data points additional to the main manuscript are indicated using filled markers.

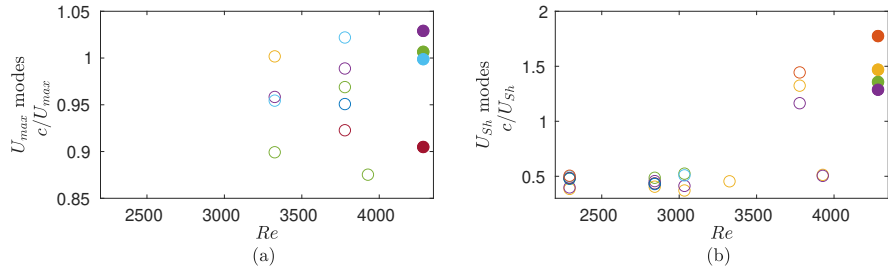


Figure S5: Supplement to Figure 13, scatter plots showing the phase speed of the observed waves divided by the mean flow speed at the estimated wave height for (a) modes at the velocity maximum and (b) modes above the velocity maximum. Data points additional to the main manuscript are indicated using filled markers.