

Raleigh-Taylor Instability

To be modified at a later time, this is only a placeholder for choosing a project

- The idea is to use rotation to temporarily stabilise an unstable Raleigh-Taylor flow
- The experiment ideally uses the rotation table, alternatively, a smaller system such as a beaker on a rotating plate could be jerry-rigged for convenience
- The experiment involves creating a Raleigh-Taylor instability by having a dense liquid suspended over a less-dense liquid by a physical barrier. If possible, another way to separate two liquids in the large rotating tank would be fantastic, but this may be unlikely
- The denser liquid is dyed, or both liquids are dyed in different colours
- By rotating the system and then allowing the fluids to mix, we can observe the Raleigh-Taylor instability and how it progresses at different rotational velocities
- The other objective is to observe the implication of the Coriolis force in stabilising the flow and attempt to find (replicate) wave modes if possible
- The main inspiration at the moment is:

“Rotating Rayleigh-Taylor instability”

M. M. Scase, K. A. Baldwin, and R. J. A. Hill

Phys. Rev. Fluids **2**, 024801 – Published 15 February 2017

“The Inhibition of the Rayleigh-Taylor Instability by Rotation”

[Kyle A. Baldwin](#)

, [Matthew M. Scase](#)

& [Richard J. A. Hill](#)

Scientific Reports **5**, Article number: 11706 (2015)

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- As a fallback, creating a salt oscillator and assessing the oscillatory behavior with varying salinity would be interesting