INERTIA–GRAVITY WAVES IN THE ROTATING ANNULUS

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ABSTRACT

This presentation will summarise the findings of a series of laboratory experiments, which were carried out over a four-year period using the rotating, two-layer annulus. The experiment is observed to contain short, fast inertia–gravity waves in addition to the large-scale, slowly evolving balanced flow. The laboratory experiments are compared to numerical simulations made using a quasi-geostrophic model. The following questions will be answered:

- By what mechanism are the inertia–gravity waves generated?
- At what rate does the balanced flow "leak" energy into the inertia–gravity waves?
- What impact do the inertia–gravity waves have on the balanced flow, and can the impact be parameterised stochastically?
- How can the flow-visualisation technique be calibrated, so that wave amplitudes can be measured?
- How does the amplitude of the inertia–gravity waves scale with the Rossby number?
- How accurately are the dynamics of the balanced flow captured by quasi-geostrophic theory?
- What are the implications of the answers to the above questions for atmospheric and oceanic fluid flow?

The results have been published in a series of papers, [1]–[7], listed below.

REFERENCES

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