Effects of inertia and stratification in incompressible ideal fluids: pressure imbalances by rigid confinement

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This talk will be principally addressed on the inertial properties of an incompressible Euler two dimensional fluid filling a horizontal channel and in hydrostatic equilibrium at infinity. The interplay between action-at-a-distance, incompressibility and constraints can lead to non-conservation of horizontal momentum even if there are no external horizontal forces acting on the system. The variation of density along the boundaries affects the evolution of the total vorticity of the fluid. The results of Euler equations obtained for small density variations will be compared with long-wave asymptotic models which provide closed-form mathematical expressions for more general results.

References

[1] Camassa, R., Chen, S., Falqui, G., Ortenzi, G. & Pedroni, M., *An inertia 'paradox' for incompressible stratified Euler fluids* J. Fluid Mech. **695**, (2012) 330–240.

[2] Camassa, R., Chen, S., Falqui, G., Ortenzi, G. & Pedroni, M., *Effects of inertia and stratification in incompressible ideal fluids: pressure imbalances by rigid confinement* J. Fluid Mech. (2013) In press.