Inertia-gravity wave radiation from the vortex in the f-plane shallow water

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Inertia-gravity waves propagate far from the source region and drive general circulation of the middle atmosphere. Recently, it has become clear that inertia-gravity waves are spontaneously radiated from unsteady motions of strong flows, such as jet. Here, inertia-gravity wave radiation from the vortex is investigated in the f-plane shallow water system. The f-pane shallow water system is the most simplified system in which both the vortex and inertia-gravity wave are exist. If the effect of the Earth rotation is negligible, the system is equivalent to the 2-dimensional compressible fluid system. Therefore, inertia-gravity waves are considered as sound waves in the aero-acoustic theory. In the poster, far fields of inertia-gravity waves radiated from several vortical configurations, such as vortex pair, merging of them, and elliptical vortex, are derived analytically and simulated numerically.

[1] **Inertia-gravity wave radiation from the elliptical vortex in the f-plane shallow water system,** Norihiko Sugimoto, *Fluid Dynamics Research*, Vol. 49, (2017), 025508, 17pp.
[2] **Inertia-gravity wave radiation from the merging of two co-rotating vortices in the f-plane shallow water system,** Norihiko Sugimoto, *Physics of Fluids*, Vol. 27, (2015), 121701, 6pp.
[3] **Cyclone-anticyclone asymmetry in gravity wave radiation from a co-rotating vortex pair in rotating shallow water,** Norihiko Sugimoto, Keiichi Ishioka, Hiromichi Kobayashi, and Yutaka Shimomura, *Journal of Fluid Mechanics*, Vol. 772, (2015), p80-106.

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