Abstract Details

<u>AOGS 1st Annual Meeting</u> > <u>Ocean and Atmospheres</u> > On the Critical Separation Distance Vortices in a Barotropic Atmosphere >

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- Paper ID: 57-00A-A1282
 - **Title:** On the Critical Separation Distance of Binary Vortices in a Barotropic Atmosphere

Abstract:

Two tropical cyclones can attract or repulse each other when they are enough for mutual interaction. Since the trajectories of two tropical c can be substantially different from each other depending on merging separation, it is important to find a reliable criterion that enables us t determine whether two tropical cyclones merge or separate. For this, motion of binary vortices in no environmental flow is investigated usir nondivergent barotropic model. According to our analyses, the critica separation distance suggested by Falkovich et al. (1995) is more pert than that of DeMaria and Chan (1984). Falkovich et al. (1995) sugges that the criterion, which determines the merging and separation of bi vortices, is related to the sign of initial relative vorticity between two vortices. Results from our numerical experiments show that binary vc separate in all cases that the initial relative vorticity is negative in the region of two vortices. However, the initial positive relative vorticity b two vortices dose not guarantee merging. Only when the magnitude (positive relative vorticity is larger than a threshold value, two vortices with time. To examine whether the critical separation distance propos an f-plane is also valid on a beta-plane, numerical experiments are performed on a beta-plane. Analysis results indicate that the beta-eff not a crucial factor that affects the merging or separation of binary vo because the magnitude of beta term is smaller than that of relative ve advection term that determines the movement of binary vortices at e stage. Therefore, the critical separation distance suggested on an f-pl seems to be valid on a beta-plane.

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