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Haltiner, G.J.

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By G. J. HALTINER

Dept. of Aerology, U. S. Naval Postgraduate School, Monterey, Calif.

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My initial comments applied to Dr. Hsieh's original paper. His reply contains an additional assumption not made previously; namely, that the vortex always consists of the same fluid particles. Also, he now considers a fixed region in the vicinity of the center, rather than following a "fictitious point at the surface moving so as to remain directly under the center of the upper vortex." In view of these changes, it appears desirable to add a few remarks.

Firstly, it should be remembered that the application of the vorticity equation necessitates a determination of df/dt and $d\zeta/dt$ following individual particles. Obviously, if it is assumed that the same particles always remain in this fixed region about the center of the vortex, a northward movement of the vortex would imply an average northward movement of the particles constituting the vortex. Clearly, then df/dt would be positive in the mean over this fixed region moving with the vortex center. However, while this additional assumption would result in the required positive contribution from upper levels to the surface pressure tendency, it does not appear warranted by a consideration of particle trajectories in the vicinity of a moving vortex. Petterssen's[1] computations, for example, do not indicate that the same particles would remain in the particular region near the center of the vortex.

To study $d\zeta/dt$, for simplicity a parabolic velocity field was suggested to apply in a small neighborhood

[1] S. Petterssen, *Weather analysis and forecasting*. New York, McGraw-Hill, 1940, p. 226.

of the center of the vortex. This model applied only to high levels, where the cyclonic vortex already existed. At these levels, as illustrated by the 500-mb chart, the strength of the vortex does not appear to increase during the period 6–8 March. It is therefore doubtful that (in terms of Dr. Hsieh's notation) a_f is greater than a_i.

The initial comments concerning df/dt and $d\zeta/dt$ for particles below the upper-level vortex apply as before.