Mesoscale Analysis on Eyewalls and Rainbands Associated with a Severe Typhoon Influenced by Taiwan High Orography

Tai-hwa Hor[1] , Chih-Hsien Wei[2] and Jian-Liang Wang
[1]*General Education Center, Lunghwa University of Science and Technology*
Taoyuan, Taiwan
e-mail:thhor@mail.lhu.edu.tw
[2] *Department of Environmental Information and Engineering,*
National Defense University

Radar observations for severe Typhoon Bilis (2000) are unique for investigating the effect of Taiwan high orography on the mesoscale structures of storm system in the vicinity of the southeastern Taiwan. Typhoon Bilis possessed the double eyewall feature and its inner eyewall exhibited an approximate circular shape in the diameter of 35 km. Convections associated with the storm stated outward propagation with linear aspect in the right flank of the system and inward migration in the left flank maintaining the development of the outer eyewall.
The low-level reverse distribution of maximum Doppler wind (stronger peak wind in the left flank of the storm and weaker peak wind in the right flank) embedded within the storm entity located at 110 km in distance from the Taiwan coastal line was confirmed and it turned to be illegible as the typhoon approached the mountainous terrain (<100 km in distance from the Taiwan coastal line), owing to its severe intensity and the location of confluent zone.

Keywords: Typhoon, double eyewall; Doppler wind, high orography.

Table 1. The peak positive and negative Doppler velocities (m/s) measured by the Green Island weather radar inside Typhoon Bilis (2000) from 1015 UTC to 1145 UTC 22 August 2000. The radar site is about 33 km away from the Taiwan coastal line.

Time Levels	1100 UTC	1115 UTC	1130 UTC	1145 UTC
1.0 km	-56.4	-59.8	-65.2	-64.9
	+64.5	+62.8	+60.9	+63.5
1.5 km	-63.8	-59.8	-65.2	-64.
	+57.5	+52.4	+60.2	+59.6

References

[1] T.-H. Hor, C.-H. Wei, M.-H. Chang and C.-S. Cheng, Doppler Radar Analysis of Typhoon Otto (1998) - Characteristics of Eyewall and Rainbands with and without the Influence of Taiwan Orography. *J. Meteor. Soc. Japan*, **83**, 1001-1023 (2005).
[2] H. Sakakibara, M. Ishihara and Z. Yanagisawa, Structure of s typhoon rainstorm in the middle latitudes observed by Doppler radar. *J. Meteor. Soc. Japan*, 63, 901-922 (1985).