Preliminary Analysis of Three-Dimensional Wind over Complex Terrain in South Korea **Using Multiple-Doppler Radar Observations**



Background



- Detailed three-dimensional winds are very important information to valid the impact of topographic effects on precipitation.
- Complete wind information retrieved by multiple-Doppler radar, which can reduce the problems of beam blockage associated with complicated topography.
- The interactions between a case of low pressure and topography in Korea were shown to understand the variance of precipitation intensity and distributions.

3. Airflow and Precipitation Structures



Stronger cross-barrier flow (Vc, color shaded) only existed along the valley (near crest) exceeding 28 m s⁻¹ over the mountain in domain A (B).

- Occurrence of stronger radar reflectivity (>30 dBZ) with the frequency greater than 50% (broad contour) were observed during the studied case (2016/07/01 09-13 UTC for 4 hours).
- High frequency of convective precipitation were concentrated on the southern slope (mountain crest) in domain A (B).



onclusion

Fine scale wind and precipitation structures over complicated topography in Korea can be recognized successfully by the WISSDOM. Enhanced precipitation concentrated on windward slope (near mountain crest) of the northern (southern) branch and associated (dissociated) with stronger cross-barrier flow and updraft The intensity and distrive of precipitation may dominate by the interactions between different shape of topography and airflow.

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data.



Topographic features (color shaded), high frequency of convective precipitation (black broad contour), stronger Vc (blue contour, broad one indicated the speed over 28 m s⁻¹), **updraft** (red contour, over than 1 m s^{-1}).







Strikingly different wind features were retrieved by **3 radars** (GNG, GDK, SBS, upper panel) and 6 radars (adding WNJ, JWN, KAN, lower panel).

Stronger wind and flow deflection can be detected in the valley via 6 radars.

Horizontal winds (vectors and flags), coverage of radar data (white dot, left panel) and U-component (color shaded, right panel).

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