

## **Elevation-dependent trends in precipitating features observed by the NAME radar network**

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Radar data from the 2004 North American Monsoon Experiment (NAME) Enhanced Observing Period (EOP) are used to investigate diurnal trends and vertical characteristics of precipitating features relative to local terrain. Two-dimensional composites of reflectivity and rain rate, created from the two C-band SMN Doppler radars and NCAR's S-band polarimetric Doppler radar (S-Pol), are divided into four elevation groups: over water, 0-1000 m (MSL), 1000-2000 m, and greater than 2000 m. Analysis of precipitation frequency and average rainfall intensity using these composites reveal a diurnal trend in precipitation similar to that observed by the NAME Event Rain gauge Network (NERN). Precipitation occurs most frequently during the afternoon over the Sierra Madre Occidental (SMO), with the peak frequency moving over the lower elevations by evening. Also, the precipitation events over the lower elevations are found to be less frequent but of greater intensity than those over the SMO.

Precipitation echoes were then partitioned into convective and stratiform grid points to allow for examination of vertical characteristics of convection using 1-km vertical resolution data from S-Pol. Analyses of reflectivity profiles and echo-top heights confirm that convection over the lower terrain is more intense and vertically developed than convection over the SMO. Warm-cloud depths, determined from the CSU-NAME upper-air and surface gridded analyses, appear, on average, to be twice as deep over the lower terrain as compared to the shallow convection over the SMO. Finally, using a simplified stochastic model for droplet growth from RAMS, it is shown that these differences in warm-cloud depths can explain the observed elevation-dependent trends in precipitation intensity.