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Examining the influence of local terrain on surface winds and boundary layer structure at the South Pole: Implications for "chemical events"

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Past studies at the South Pole have indicated significant correlation between surface wind direction and concentrations of nitric oxide (NO). Concurrently, improvements in mapping of surface topography over Antarctica suggest that the South Pole Station lies at what may be the exit region of a shallow basin extending to the southeast of the station. This basin covering about 10,000 square km rises about 200 m in elevation from the Pole. A slight ridge lies about 200 km south of the Pole while an extensive plateau area lies to the east. We are advancing the hypothesis, supported by a few case studies, that some periods of high NO may arise from accumulation and then draining in shallow katabatic flows from this basin. Supporting analysis will include a look at data from 1993 when four AWS were located in four cardinal directions from the Pole.