**Planetary Boundary Layer Turbulence Characterization**

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Observing atmospheric air flow dynamics can reveal useful patterns for understanding its thermodynamic processes. The planetary Boundary Layer (PBL) can be further studied by measuring vertical transport of aerosols under different synoptic conditions. The Coherent Doppler Lidar at the City College of New York has been operated during both winter and summer periods and the results are analyzed. A parameter of interest is the index of refraction structure constant, which is considered to be a measure of turbulence and represents fluctuations in the index of refraction. Data obtained from the Doppler Lidar is compared to other instruments to expose similarities and differences and how the network of instruments observe the planetary boundary layer dynamics.