

# Retrieval of the refractivity profiles from GPS down looking occultation data obtained at Mt. Fuji in 2003

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Down Looking (DL) GPS radio occultation can produce an estimate of the atmospheric refractivity profile with high vertical resolution below the altitude of GPS receiver. The main observations are a bending angle as a function of the impact parameter, which are derived from observed phase of GPS signal. DL provides both negative as well as positive elevation angle measurements. Assuming the spherical symmetry, Abel inversion can be applied to a profile of partial bending angle found by subtracting the positive elevation measurement from the negative one with the same impact parameter. With the objective of obtaining water vapor profiles within the atmospheric boundary layer, the DL experiment was performed on the top of Mt. Fuji in 2003 summer. We used three measurement systems: (1) TurboRogue SNR-8000 GPS receiver and choke-ring antenna; (2) NovAtel OEM-4 and high gain antenna; (3) new GPS receiver and antenna developed for airborne GPS occultation measurement. We succeeded in deriving the refractivity profiles, which were consistent with the radiosonde observations, from these DL measurement data by applying Abel inversion. These profiles obtained from three measurement systems are compared each other in order to verify the system suitable for DL occultation measurement. We discuss the recent developments in the retrieval technique of DL occultation data.