## A Robust Method to Detect Atmospheric Boundary Layer (abl) Top and Its Global Distribution Observed Using COSMIC GPS RO Satellite Data

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The ABL top is the lowest layer of the atmosphere which is directly influenced by the earth's surface. Accurate determination of the ABL top is important for studies related to transport processes in the troposphere, atmospheric chemistry, environmental pollution, numerical weather prediction and climate monitoring. Over oceanic regions the Marine ABL plays a crucial role in regulating the surface energy and moisture fluxes and in controlling the convective transfer of energy and moisture to the free atmosphere.

In this study we introduce a new parameter called refractivity (N) to detect the ABL top and found very good correlation with other traditional parameters from GPS sonde in all weather conditions. This has been validated with the independent direct measurements of COSMIC GPS RO. A very good correlation between the two techniques suggest that new parameter (N) proposed in this study can be used to estimate the ABL top. A strong diurnal variation in the ABL top is found. ABL top is higher during pre-monsoon (MAM) followed by monsoon(JJA), post monsoon(SON) and winter(DJF) also studied justification and additional advantages of using N.

In order to detect the ABL top more precisely we have adopted a robust method called wavelet covariance transform which is very useful in detecting even small transitions occurring in the profile throughout the globe. ABL top is found higher in tropics and gradually decreases towards poles. ABL top is higher during northern hemisphere (NH) summer months (JJA) over South American, African, and Asian regions when compared to NH winter (DJF). Over tropics and subtropics in the Pacific, ABL top is higher during NH summer (JJA) followed by fall equinox (SON), and this feature is not seen during spring equinox (MAM) and NH winter (DJF). A clear variation in the ABL top with respect to the ITCZ is seen.