



Performance of Acoustic Sounder and analysis of various features of Atmospheric Boundary Layer height during extreme weather conditions

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The Atmospheric Boundary Layer (ABL) height is measured with the help of Monostatic SODAR (Sonic Detection And Ranging) System [1]. Meteorological aspects of Doppler free acoustic sounding (Mono-static SODAR system) of the atmosphere are considered [2,3]. This instrument plays an important role in ABL studies using remote sensing techniques, where other techniques (like Radio-sonde, LIDAR, and Mast etc.) are difficult and expensive. Various features of Mono-static SODAR records with direct measurements with meteorological sensors in ABL are analysed. Some primary results regarding the statistical analysis of the ABL height, meteorological parameters, atmospheric pollutants of main physical parameter of the ABL (Atmosphere) were shown and discussed for the metropolitan city Delhi during the periods of October 2016 to February 2017. During mid-October to mid-November low height of ABL were observed due to high concentration of atmospheric pollutants and low wind speed. During the period of mid-December 2016 to mid-January 2017, fog episodes and strong low level elevated and inversions were observed most of the time.

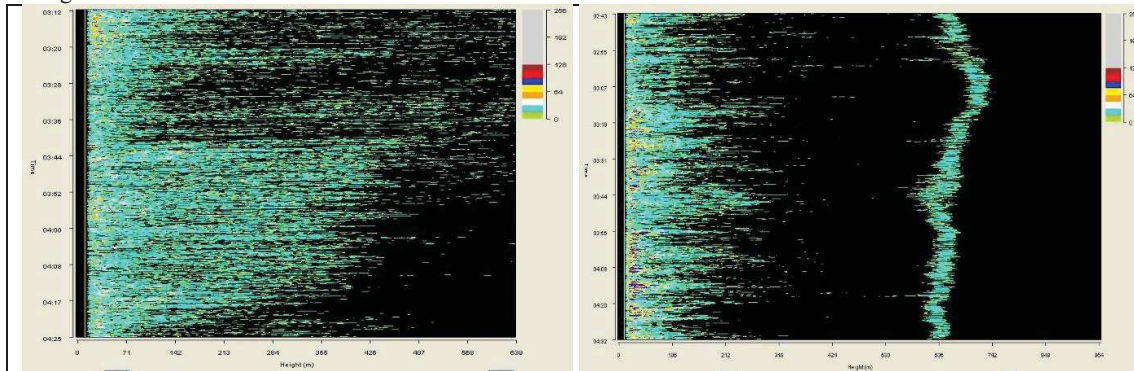


Figure 1. Thunderstorm Condition

Figure 2. Foggy Condition

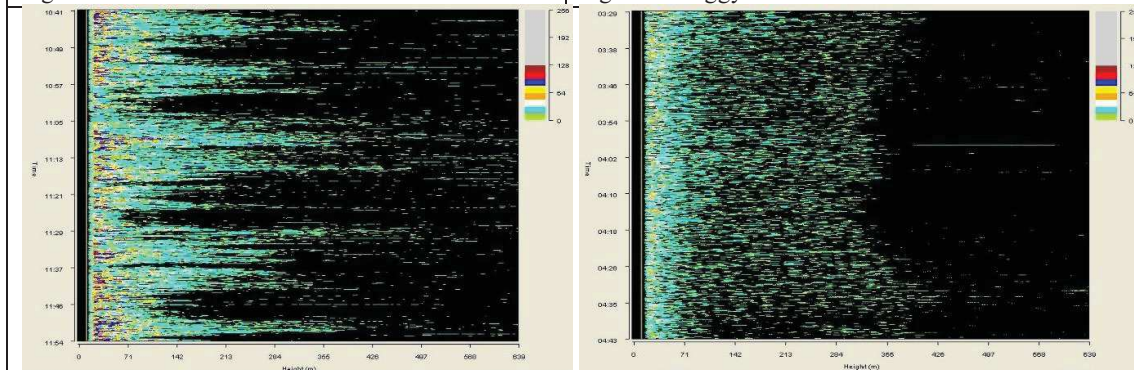


Figure 3. Thermal Plume during Day time

Figure 4. Wave motion Condition

Reference

- [1] Roland B Stull, *An introduction to boundary layer meteorology*. Vol. 13. Springer Science & Business Media, 2012.
- [2] Stuart Bradley, *Atmospheric acoustic remote sensing: principles and applications*. CRC Press, 2007.
- [3] S. P. Singal, 1989. *Acoustic sounding stability studies*. Encyclopedia of Environment Control Technology, 2, 1003-1061.