1. Rationale

PBL (Planetary Boundary Layer) depth:
- determines pollutant mixing volume
- critical component in air pollution models
- key parameter for assessment of concentrations

2. Measurement Campaign

• Gual Pahari station (28.43° N, 77.15° E, 243 m ASL), 20 km South of N. Delhi
• Emission sources: city emissions, vehicles, power production, dust from Thar desert

3. Methodology

<table>
<thead>
<tr>
<th>Method</th>
<th>Temporal Resolution</th>
<th>Vertical Resolution</th>
<th>Horizontal Resolution</th>
<th>PBL determination method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raman lidar POLAR® [1]</td>
<td>15 min adjustable</td>
<td>30 m</td>
<td>point measurement</td>
<td>Wavelet Covariance Transform (WCT) [2, 3]</td>
</tr>
</tbody>
</table>

Modifications of WCT Technique

- Initial signal decrease 10%
- Final signal decrease 14%

✓ Avoidance of misleading gradients inside PBL

4. PBL variability over New Delhi Seasonal PBL Cycle

Mean Diurnal Cycle

- 5. Conclusions

• WCT technique with proper modifications can detect PBL top efficiently
• During March 2008–March 2009 weaker seasonal PBL cycle compared to the climatologically expected cycle
• High interseasonal variability of PBL height due to synoptic and meteorological forcings, especially in the pre-monsoon season
• Higher growth rates during the pre-monsoon season

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References


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