Title:	On the understanding of surface ozone variability, its precursors and their associations with atmospheric conditions over the Delhi region
Authors:	Attada, Raju (/jspui/browse?type=author&value=Attada%2C+Raju)
Keywords:	Annual cycle High ozone days Photochemical reactions Surface ozone
Issue Date:	2021
Publisher:	Elsevier
Citation:	Atmospheric Research, 258, 105653.
Abstract:	The present study investigates the variability of surface ozone (O3) and its precursors (NOX, CO) at different time scales for 3-year period (2016–2018) using continuous ground-based observations from 25 stations located within the Indian Capital Delhi (28.83°N, 77.81°E). Observations indicate that there is a clear spatial heterogeneity and seasonality in surface O3 where larger magnitudes (40–60 ppb) are observed during pre-monsoon season, and 10–20 ppb in other seasons. The frequency distribution exhibits that 70% of O3 concentrations are in the range of 10–50 ppb, while 10% lies larger than 50 ppb and the remaining 20% is mostly confined within 50–80 ppb. Further, a detailed analysis on the diurnal cycle of surface ozone and its precursors performed over IMD Lodhi Road location. Analysis of diurnal cycles show maximum and minimum O3 concentrations during the morning and nocturnal hours, with a rate of change 4.8 ± 1.96 and −7.4 ± 0.95 ppb h−1, respectively. On the other hand, the rate of change of O3 during high ozone days (HOD) is found to be 5.61 ± 2.6 ppb h−1 in the morning and −8.04 ± 3.4 ppb h−1 in the evening hours, respectively. It is also noted that the increase in precursor concentrations and associated titration effects appear to play a considerable role in surface O3 depletion during the evening hours. It is also noted from the composites of HODs that there is an enhanced diurnal O3 (80–90 ppb) concentrations compared to 3-year average (40–60 ppb). Further evaluation of associations between surface O3 changes and meteorological parameters shows that observed surface O3 (Copernicus Atmosphere Monitoring Service-CAMS modelled O3) show positive correlations of R2 = 0.3 (0.42) with temperature, of R2 = 0.47 (0.60) with Solar Radiation (SR), of R2 = 0.39 (0.59) with boundary layer height. An overall assessment shows CAMS modelled three year daily averaged ozone values are generally in good agreement with surface ozone observations with a CC value of about R2 = 0.65.
Description:	Only IISER Mohali authors are available in the record.
URI:	https://doi.org/10.1016/j.atmosres.2021.105653 (https://doi.org/10.1016/j.atmosres.2021.105653) http://hdl.handle.net/123456789/4343 (http://hdl.handle.net/123456789/4343)
Appears in Collections:	Research Articles (/jspui/handle/123456789/9)

Files in This Item:

File	Description	Size	Format

Need To Add…Full Text_PDF..pdf (/jspui/bitstream/123456789/4343/1/Need%20To%20Add%e2%80%a6Full%20Text_PDF..pdf)	Only IISER Mohali authors are available in the record.	15.36 kB	Adobe PDF	View/Open (/jspu

Show full item record (/jspui/handle/123456789/4343?mode=full)

(/jspui/handle/123456789/4343/statistics)