



Contribution ID: 116

Type: Oral Presentation

Solar irradiance in Gauteng during the 2020 COVID-19 lock-down – can we detect decreased aerosol loading?

Tuesday, 27 July 2021 15:30 (15 minutes)

During the early high-level lockdown linked to the COVID-19 pandemic in 2020 much of the South African industrial and economic sectors ground to a halt. This provided an opportunity to identify the role human activities have on the local contribution to aerosol emissions in Gauteng by comparing the 2020 atmospheric turbidity during that time of the year with the levels observed in prior years. We examine Council for Scientific and Industrial Research solar spectral irradiance, broadband irradiance and weather data for the period in question together with corresponding data from an earlier year. We categorise days and months according to the measured degree of turbidity for the period April-July for 2018 and 2020 through analysis of the relationship between the measured irradiance and the solar zenith angle on cloud-free days. Spectral data also allows an insight into the aerosol type and particle size. We discuss whether the solar irradiance data provides evidence of lower aerosol concentrations due to the COVID-19 lockdown.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

MSc

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Session Classification: Applied Physics

Track Classification: Track F - Applied Physics