

Title of the paper: Impact of intense dust storm of March 2012 on surface reaching solar radiation over Pune.

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#### Abstract

Usually Dust storms are common in the north-western part of the Indian subcontinent. During the mid of March 2012, an intense dust storm spanned thousands of kilometers from the Red Sea to Afghanistan, and from the Arabian Peninsula to India. During this period, India is under the influence of this severe dust storm and the MODIS observed AOD is about 0.9 -1.0 in the northern India. Due to the presence of anticyclone in the Arabian Sea, the transport of dust to the southern peninsula was delayed. It reached Pune only after 21st March as observed by MODIS. The shadow band radiometer measurements at Pune showed drastic increase in AOD up to 0.7 (500 nm) on 22nd and 23rd March with the dominance of dust component. CALIPSO retrieved aerosol vertical distribution showed the elevated dust layer up to 4 km. Due to this dust loading, solar dimming observed at the surface from the ground measurements is  $\sim 300$  W/m<sup>2</sup>. The radiative forcing derived from the model is  $\sim -32$  W/m<sup>2</sup> at the surface and  $\sim 15.98$  W/m<sup>2</sup> at the top of the atmosphere.