Supplementary Information

Increased absorption by coarse aerosol particles over the Gangetic-Himalayan region

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Note A

For clarity, the absorption coefficient and spectral index values are plotted in Fig. S1 for days 135-170. In this period, on the whole, the absorption rose to a higher value than previously. Moreover, the observed large deviation in absorption suggests the presence of large-micron aerosol, leading to increased absorption for $D_{1\mu m}$ particles and near-constant absorption for $D_{10\mu m}$ particles. These results suggest that significant amounts of super-micron particles were loaded continuously into the ambient aerosol over a period of about 15-20 days, starting at about day 140, and that this caused a steady increase in absorption for both $D_{1\mu m}$ and $D_{10\mu m}$ particles. The level of absorption attains a peak at about day 158.
Supplementary Figure S1 – Daily averaged absorption coefficient (a) and ASI (b) for days 135-170.
Note B

Daily variations of aerosol scattering coefficients in three wavelength bands — 450, 558 and 700 nm — for $D_{1\mu m}$ and $D_{10\mu m}$ particles from June 9, 2011, to March 31, 2012. Data are missing in the white areas.

Supplementary Figure S2 – Temporal and spectral variation of aerosol scattering between June 9, 2011 to March 31, 2012.
The surface wind measurements from GVAX indicate that the wind direction in Nainital was commonly from the northwest and southeast.

**Supplementary Figure S3:** Surface wind measurements from GVAX.