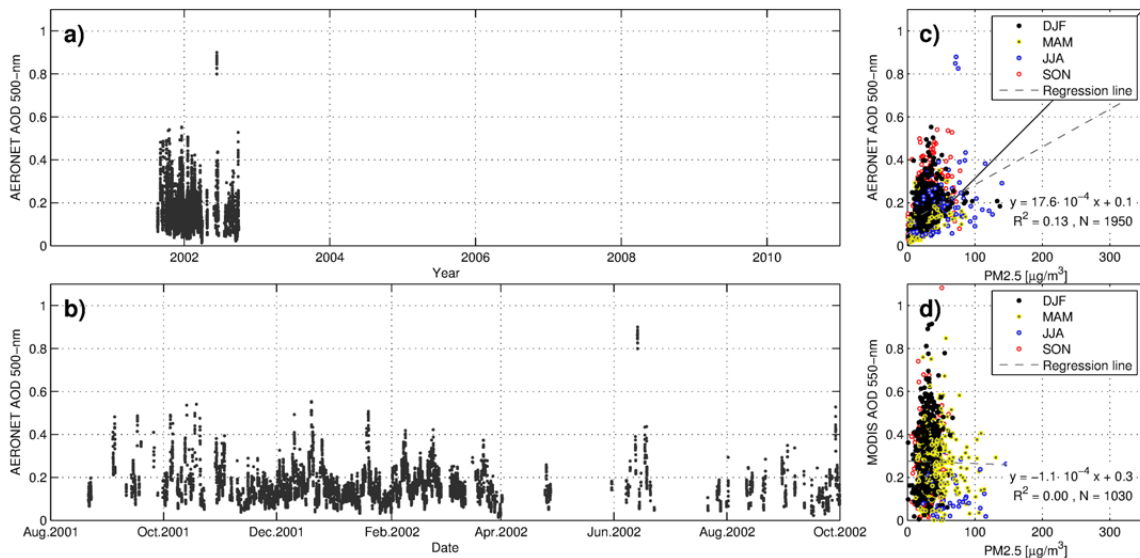


## Supplementary Materials

**Supplementary Figure 1:** Panels (a) and (b) show available Level 2 AERONET 500-nm AOD time series over Santiago. Panel (a) is displayed on an equivalent temporal scale to that of Figure 1 (a) in the manuscript. Panel (b) displays the same data set with greater temporal resolution. Panel (c): scatter plot of hourly PM<sub>2.5</sub> surface concentrations and concurrent AERONET 500-nm AOD over Santiago disaggregated by season. The AERONET AOD in panel (c) were calculated using the average of Level 2 AERONET AOD over a  $\pm 30$  minute window around PM measurement time and only if 3 or more successful retrievals in the  $\pm 30$  minute window were available. Panel (d): Hourly PM<sub>2.5</sub> surface concentrations and concurrent MODIS 550-nm AOD over Santiago, disaggregated by season.



**Supplementary Figure 2:** Monthly means of AOD and surface reflectance at the Trelew AERONET site for the year 2007. The AOD and surface reflectance belong to the same data set and underwent the same data processing as the Santiago MODIS AOD and surface reflectance. For details please see the main text.

