

*Supplement of*

**Field measurements for Quantifying Semi-Volatile Aerosol Influence on Physical and Optical Properties of Ambient Aerosols in the Kathmandu Valley, Nepal**

**Sujan Shrestha<sup>1,2\*</sup>, Siva Praveen Puppala<sup>1\*</sup>, Bhupesh Adhikary<sup>1</sup>, Kundan Lal Shrestha<sup>2</sup>, Arnico K. Panday<sup>1</sup>**

*Correspondence to:* Siva Praveen Puppala ([SivaPraveen.Puppala@icimod.org](mailto:SivaPraveen.Puppala@icimod.org)) and Sujan Shrestha ([sujanshrestha101@gmail.com](mailto:sujanshrestha101@gmail.com))

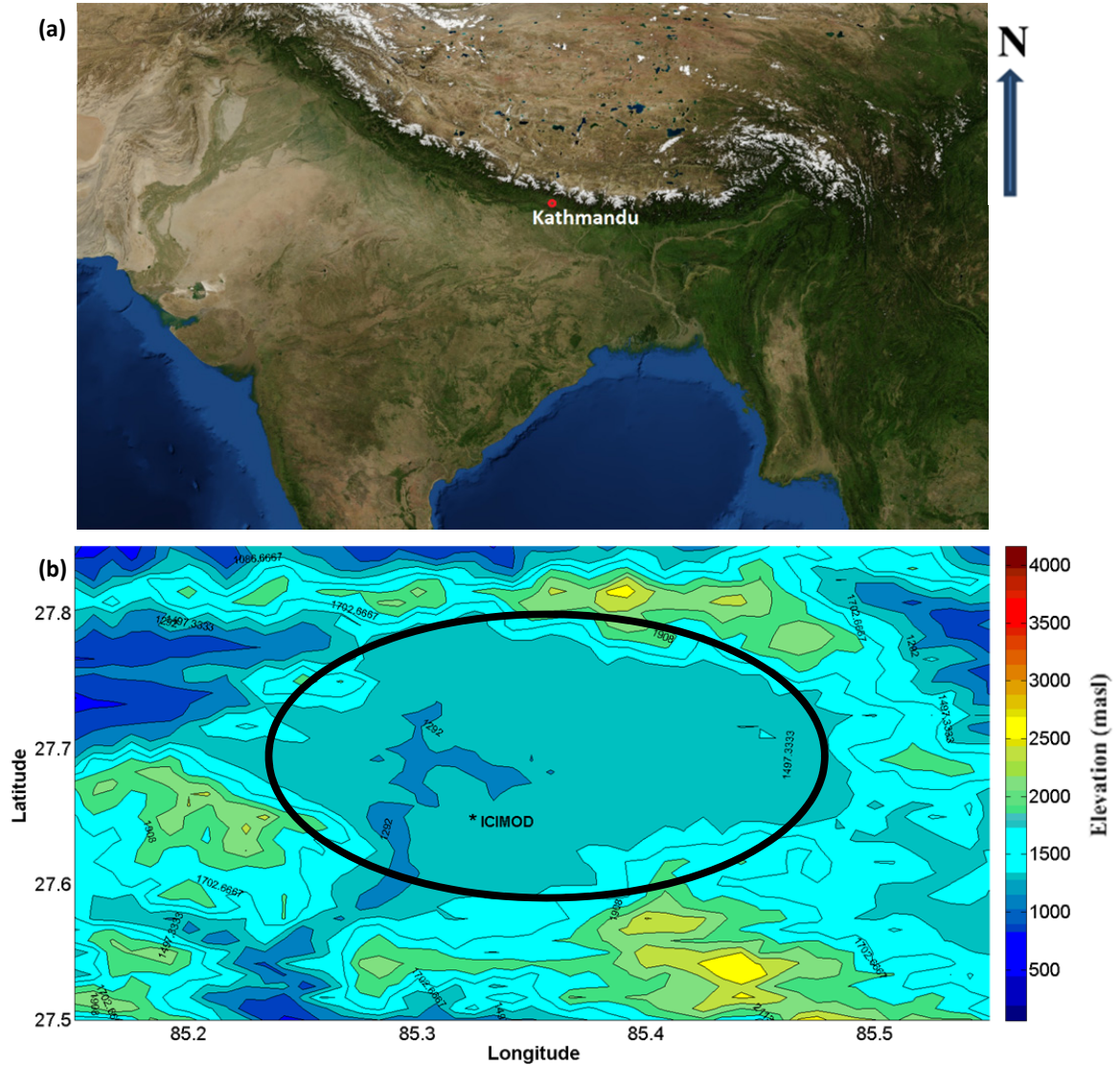
**Table S1.** Summary of four sets of experiments carried out with their respective sampling dates

S.N.	Experimental setup	Experiment date
1	Semi-volatile aerosol contribution to particle number concentration using CPC and thermodenuder setup	March-April, 2015
2	Semi-volatile aerosol contribution to aerosol size distribution using SMPS and thermodenuder setup	June, 2015
3	Semi-volatile aerosol contribution to total aerosol absorption using aethalometer and thermodenuder setup	April, 2015
4	Semi-volatile aerosol contribution to total aerosol scattering using nephelometer and thermodenuder setup	July, 2015

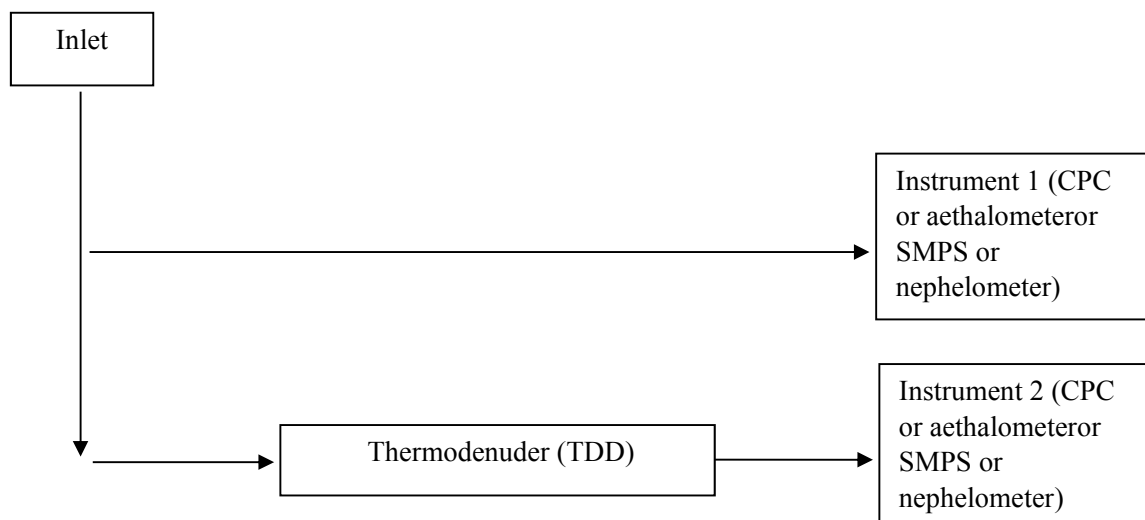
**Table S2.** Summary of semi-volatile aerosol fraction's physical properties at various temperatures.

TDD set temp. in °C	Semi-volatile fraction of aerosol measured by CPC (%) <sup>a</sup>	Semi-volatile fraction of aerosol measured by SMPS (%) <sup>a</sup>
Room temp.	12	20
50	16	26
100	18	32
150	23	-
200	28	52
250	46	-
300	49	62

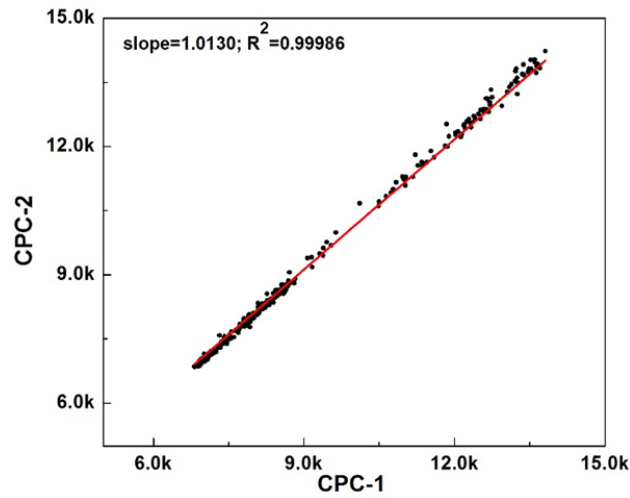
<sup>a</sup>The fractions represented in the table are derived from linear interpolation of slopes



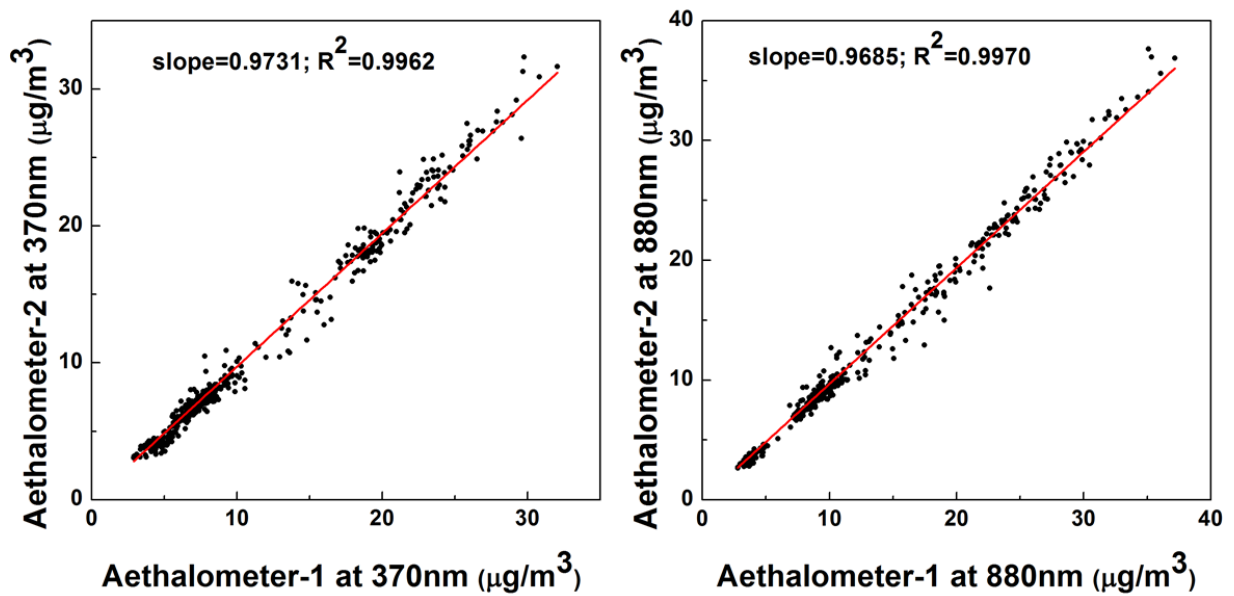
**Fig. S1.** (a) Satellite image of South Asia showing the location of Kathmandu Valley (indicated by red square symbol). (b) Elevation contour map displaying the Kathmandu valley and the ICIMOD sampling site indicated by symbol “\*”. Color bar indicates elevation above mean sea level in meters. The red square in the top figure (a) has same coordinates as the bottom figure (b).



**Fig. S2.** Schematic of instrumental setup. CPC, aethalometer, SMPS and nephelometer were operated at flow rates 1.5 lpm, 2 lpm, 1 lpm and 5 lpm respectively. Identical instruments were maintained with same flow rates. At a time, the experiment was carried out with only one set of instruments, i.e. either CPC or aethalometer or so on.



**Fig. S3.** Comparison of collocated CPC particle concentration (CPC-1 and CPC-2 indicate the particle concentration (#/cm<sup>3</sup>) measured in individual CPC instruments)



**Fig. S4.** Comparison of collocated Aethalometers black carbon concentration at 880 and 370nm (Aethalometer-1 and Aethalometer-2 indicate the black carbon concentration ( $\mu\text{g}/\text{m}^3$ ) measured in individual Aethalometers).

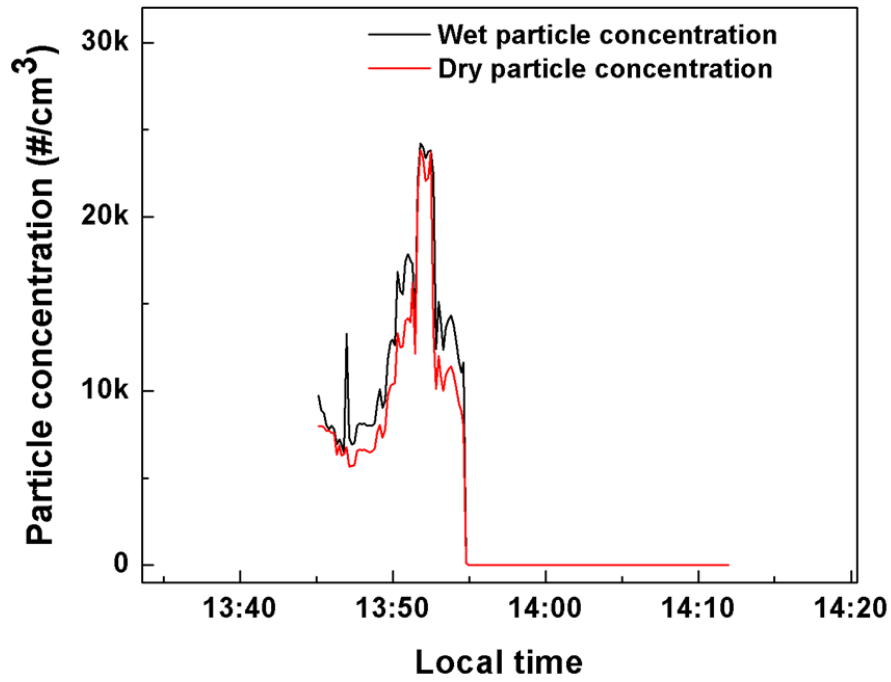


Fig. S5. Leakage test conducted with CPC showing number concentration abruptly decreased to zero value in both instruments sampling wet and dry sample when HEPA filter is placed.

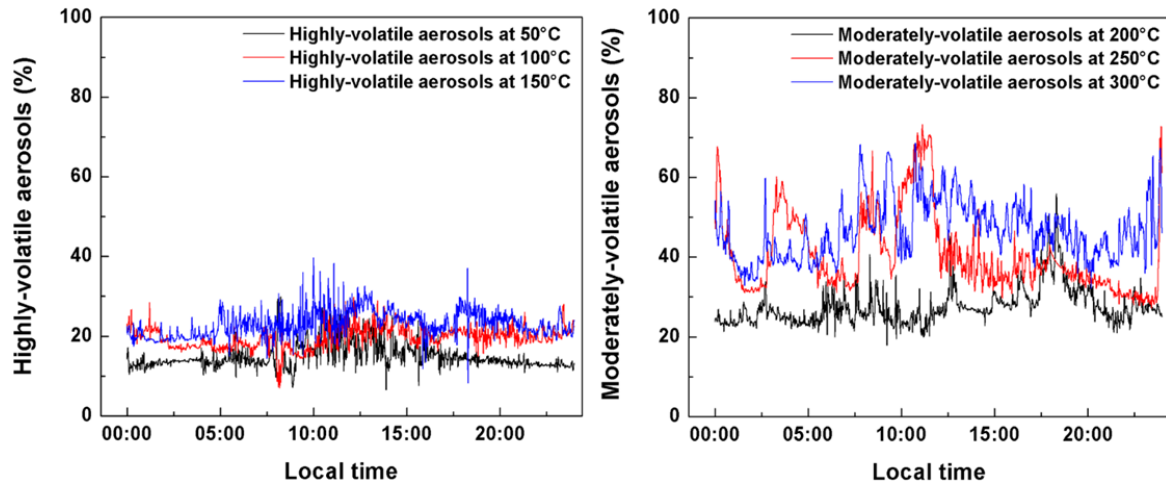


Fig. S6. Diurnal variation of highly-volatile and moderately volatile aerosols.