

Supplementary Information

Towards comprehensive air quality management using low-cost sensors for pollution source apportionment.

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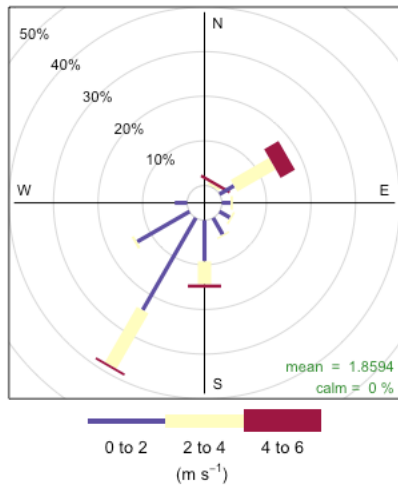
Weekday	CL1	CL2	CL3	CL4	CL5
Monday	-	-	7	-	17
Tuesday	-	-	21	2	1
Wednesday	-	-	22	2	-
Thursday	5	-	15	8	-
Friday	11	5	4	4	-
Saturday	5	4	-	15	-
Sunday	8	-	13	3	-

Supplementary Table 1: Cluster occurrence per weekday at Charlbury site



Supplementary Figure 1: **Map of the sites**

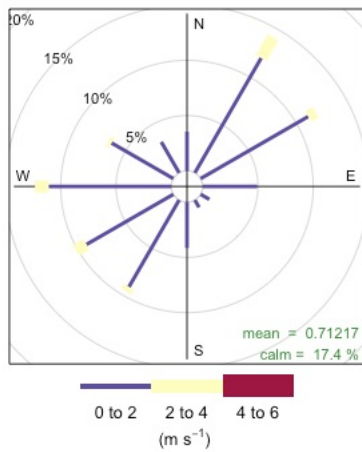
Map of the location and sites of the present study (Map by ©Google)



Frequency of counts by wind direction (%)

Supplementary Figure 2: **Wind profile at Curzon Street**

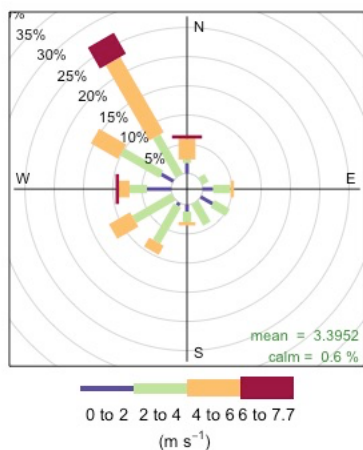
Windrose for the measuring period at the Curzon Street site.



Frequency of counts by wind direction (%)

Supplementary Figure 3: **Wind profile at the Mountsorrel quarry**

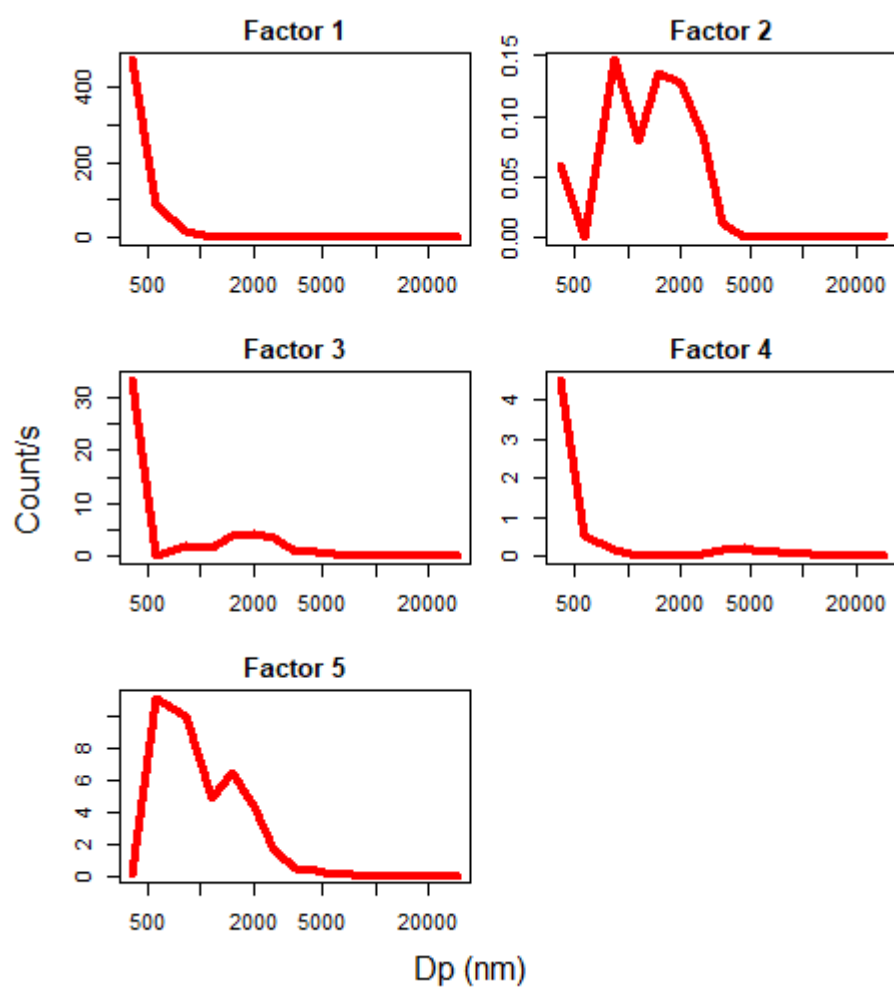
Windrose for the measuring period at the Mountsorrel quarry.



Frequency of counts by wind direction (%)

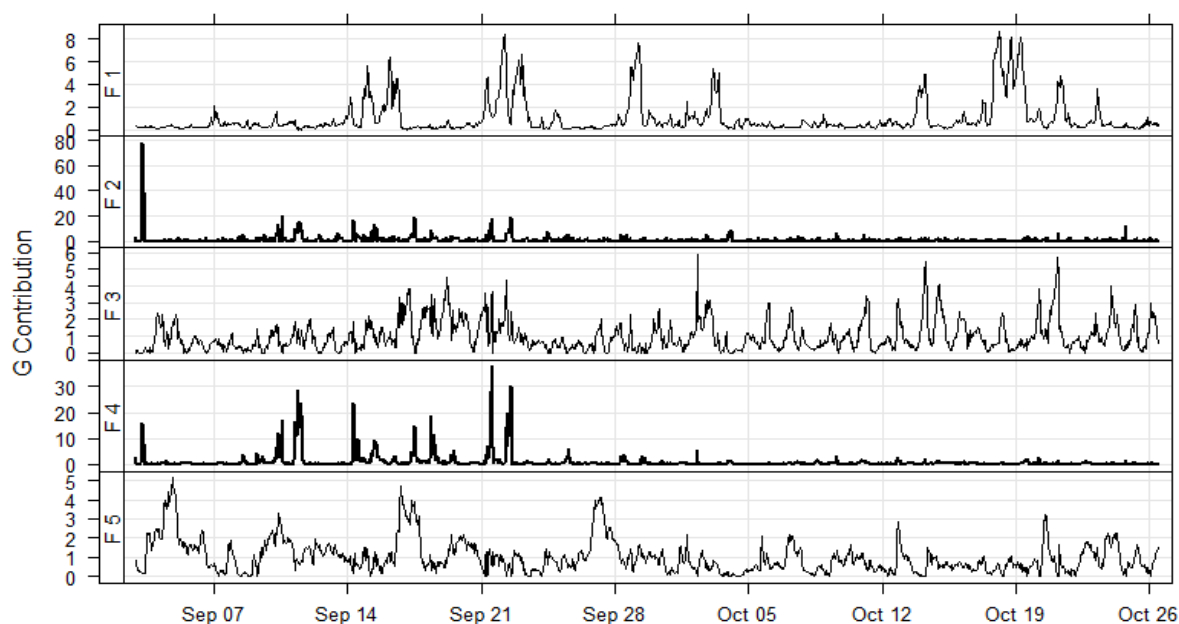
Supplementary Figure 4: **Wind profile at the Charlbury roadside site.**

Windrose for the measuring period at the Charlbury roadside site.



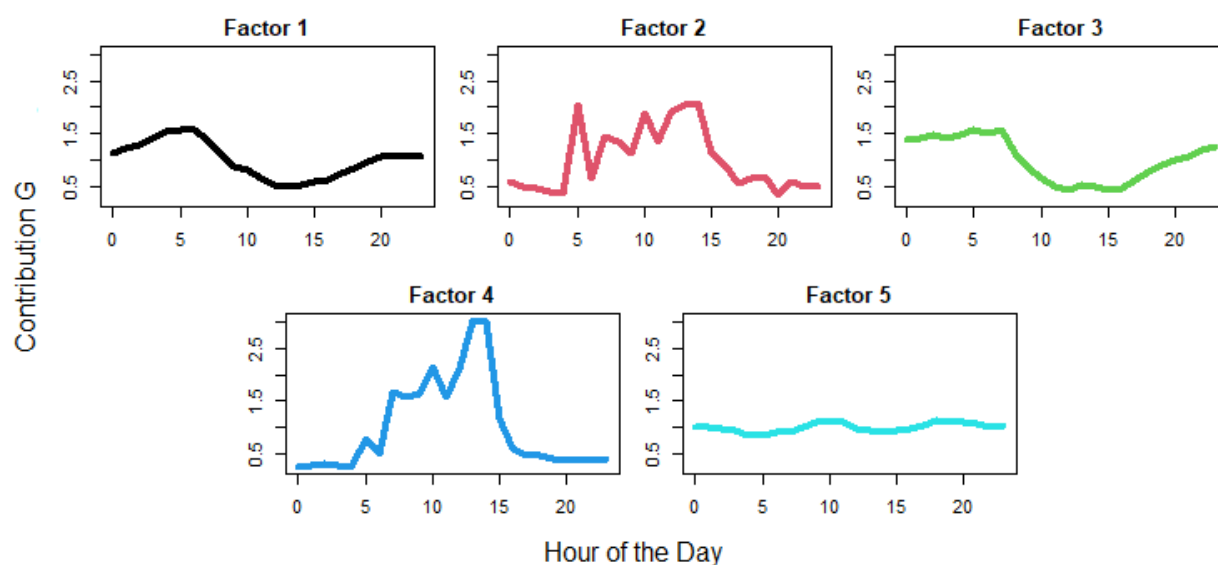
Supplementary Figure 5: **PNSD profiles of the factors at the Curzon Street.**

Particle Number Size Distribution profiles of the factors from PMF analysis at the Curzon Street site.



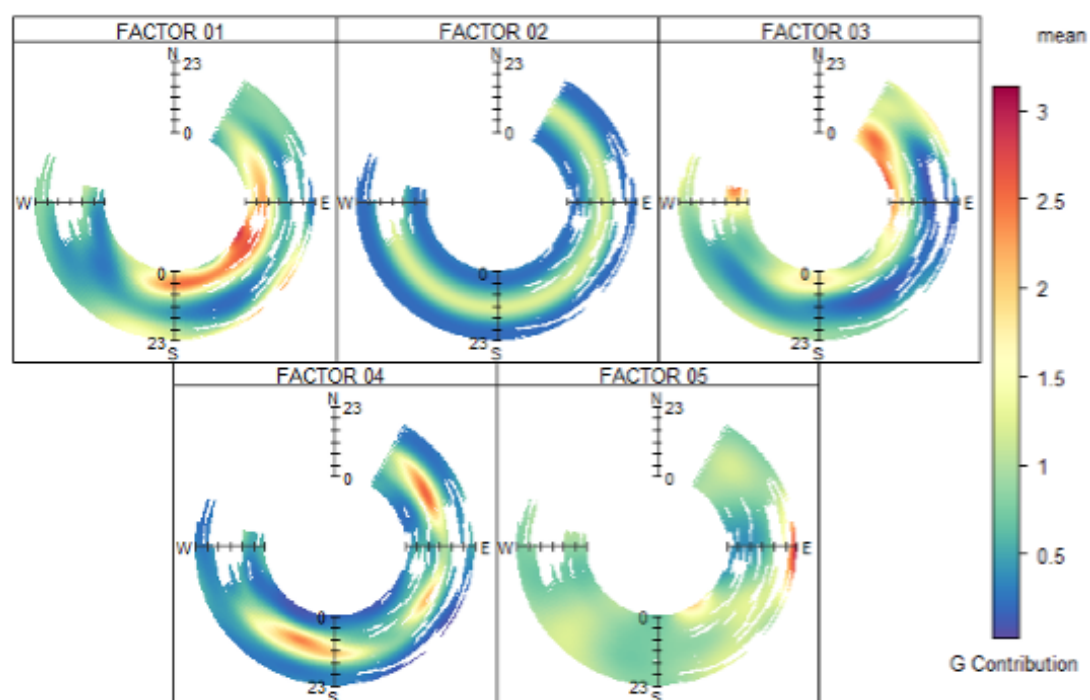
Supplementary Figure 6: **Temporal variation of the factors at the Curzon Street.**

Temporal variation of the G contribution of the factors from the PMF analysis at the Curzon Street site.



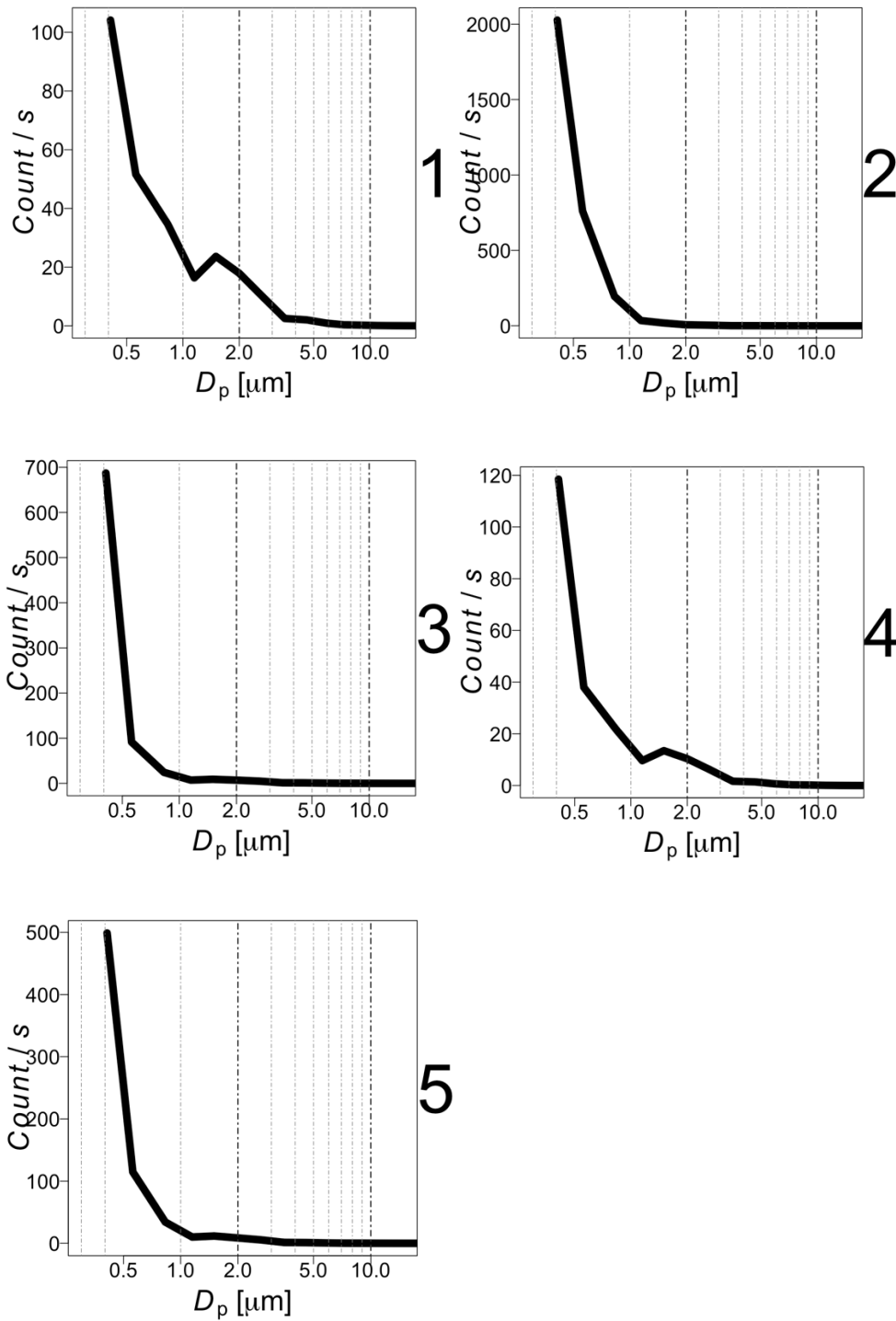
Supplementary Figure 7: **Diurnal variation of the factors at Curzon Street.**

Diurnal variation of the G contribution of the factors from the PMF analysis at the Curzon Street site.



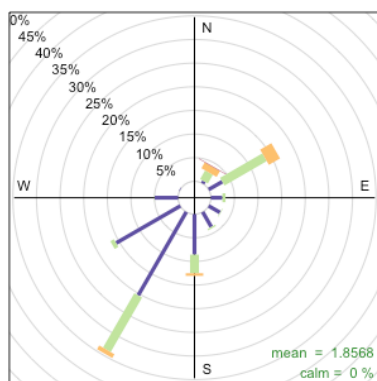
Supplementary Figure 8: **Variation of the factors' contribution at Curzon Street.**

Polar annuli of the G contribution of the factors from the PMF analysis at the Curzon Street site.



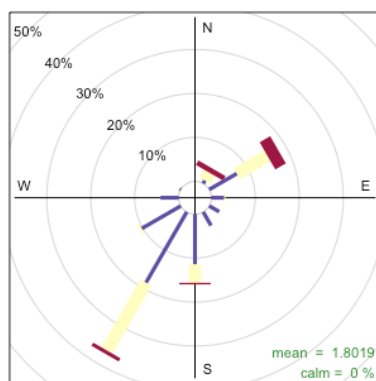
Supplementary Figure 9: **PNSD profiles of the clusters at Curzon Street.**

Particle Number Size Distribution profiles of the clusters from the k-means analysis at the Curzon Street site



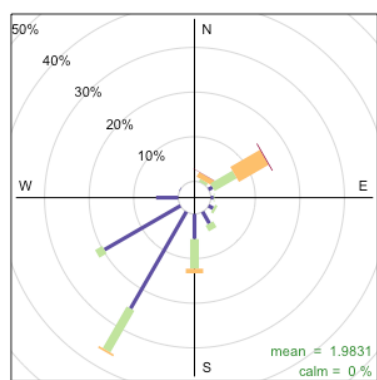
0 to 2 2 to 4 4 to 6 6 to 6.2689
(m s⁻¹)

Frequency of counts by wind direction (%) (a)



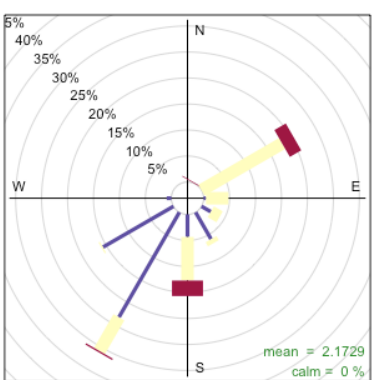
0 to 2 2 to 4 4 to 6
(m s⁻¹)

Frequency of counts by wind direction (%) (b)



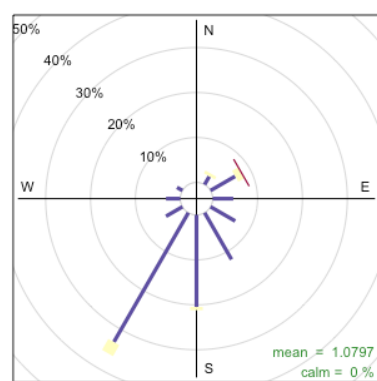
0 to 2 2 to 4 4 to 6 6 to 6.2528
(m s⁻¹)

Frequency of counts by wind direction (%) (c)



0 to 2 2 to 4 4 to 6
(m s⁻¹)

Frequency of counts by wind direction (%) (d)

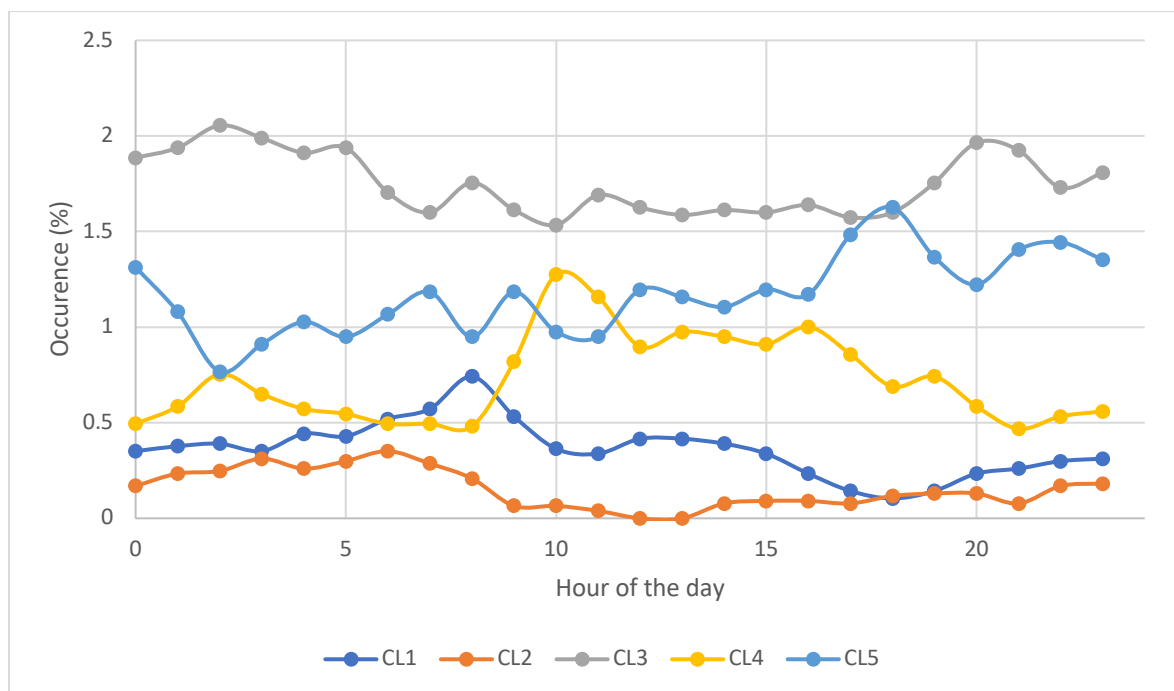


0 to 2 2 to 4 4 to 6
(m s⁻¹)

Frequency of counts by wind direction (%) (e)

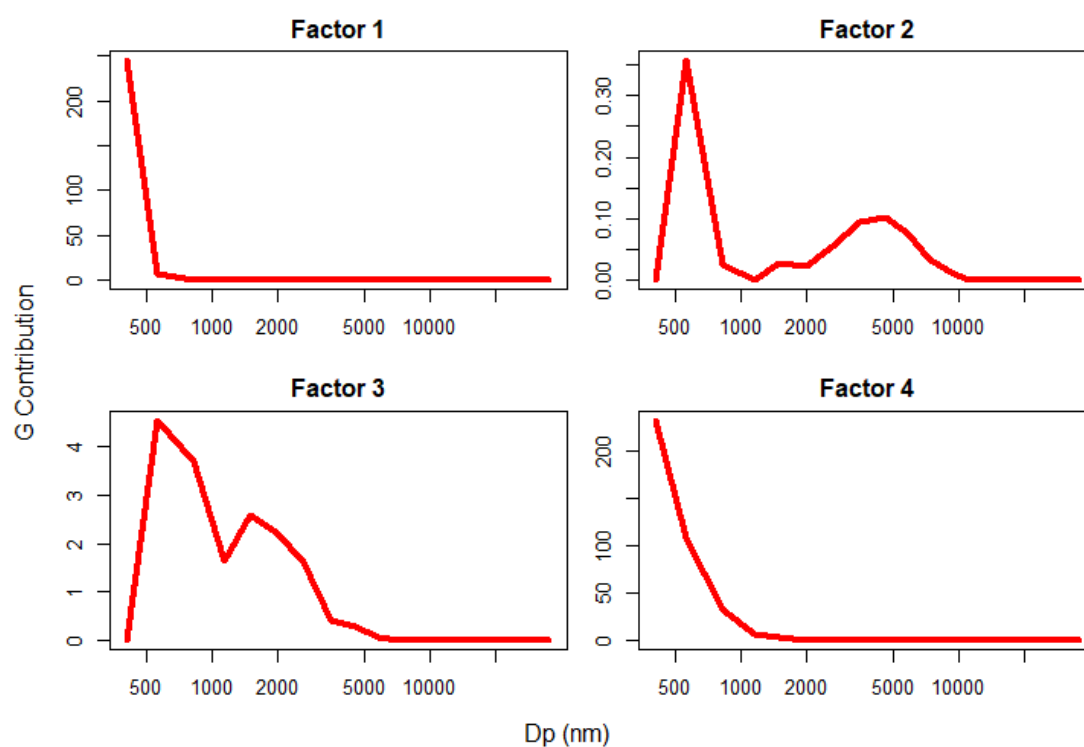
Supplementary Figure 10: **Wind profile of the clusters at Curzon Street.**

Windroses of the clusters from the k-means analysis at the Curzon Street site. (a) refers to CL1, (b) to CL2, etc.



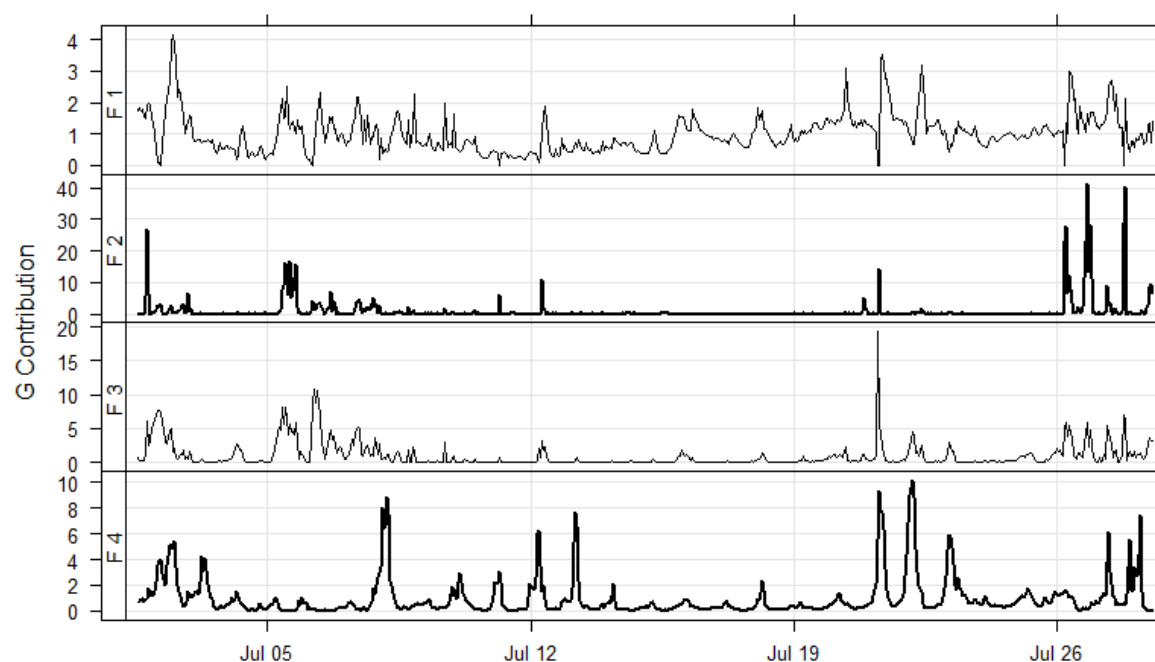
Supplementary Figure 11: **Diurnal variation of the clusters at Curzon Street.**

Diurnal variation of the clusters from the k-means analysis at the Curzon Street site.



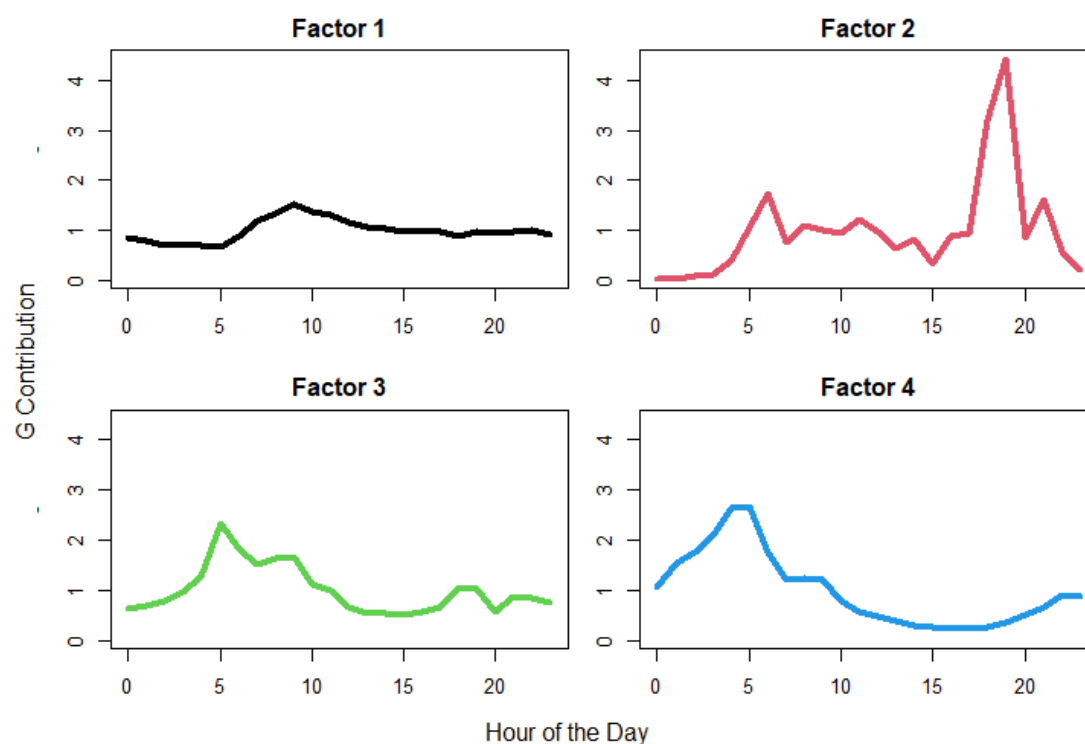
Supplementary Figure 12: **PNSD profiles of the factors at the Mountsorrel quarry.**

Particle Number Size Distribution profiles of the factors from the PMF analysis at the Mountsorrel quarry site.



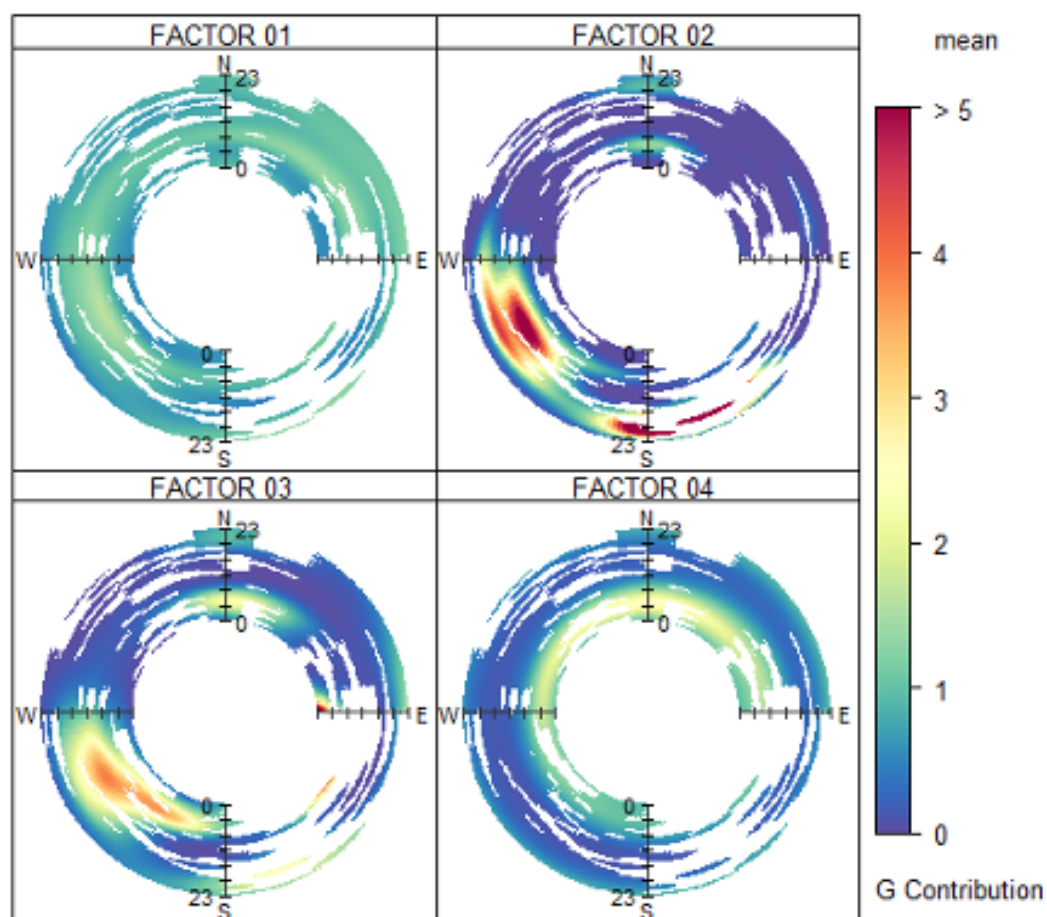
Supplementary Figure 13: **Temporal variation of the factors' contribution at the Mountsorrel quarry.**

Temporal variation of the G contribution of the factors from the PMF analysis at the Mountsorrel quarry site.

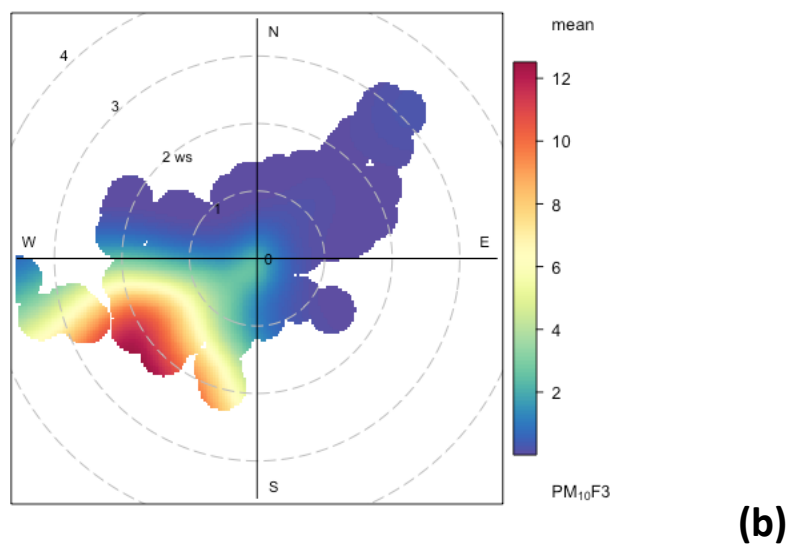
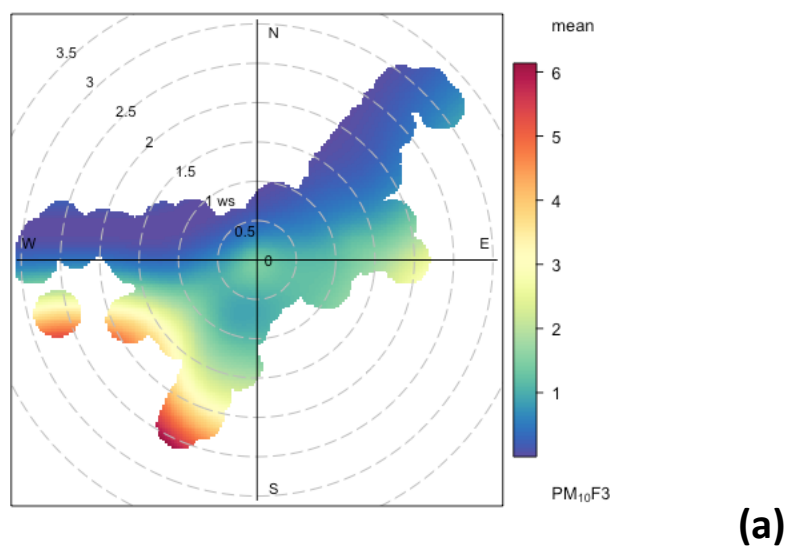


Supplementary Figure 14: **Diurnal variation of the factors at the Mountsorrel quarry.**

Diurnal variation of the G contribution of the factors from the PMF analysis at the Mountsorrel quarry site

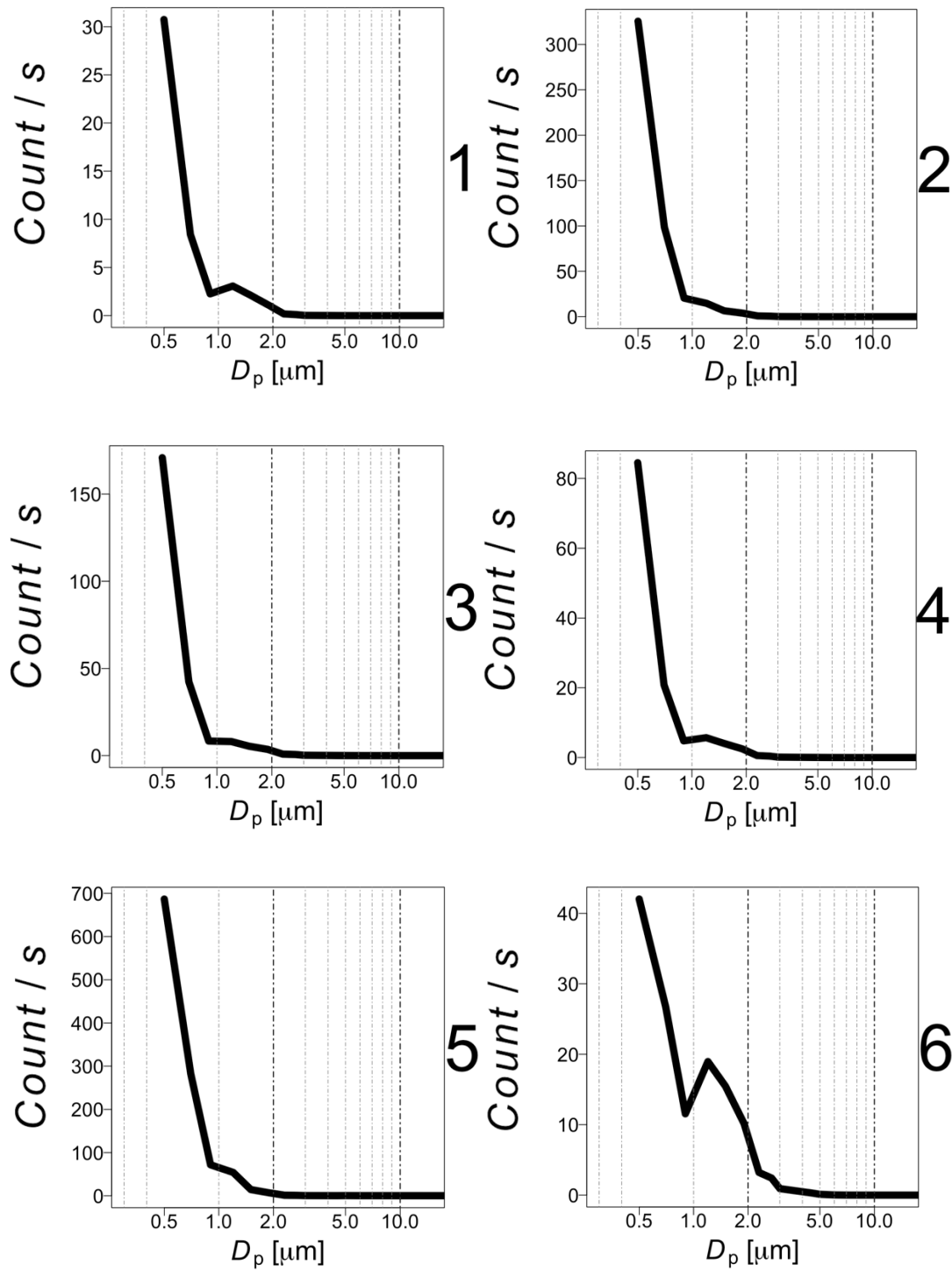


Supplementary Figure 15: **Variation of the factors' contribution at the Mountsorrel quarry.** Polar annuli of the G contribution of the factors from the PMF analysis at the Mountsorrel quarry site.



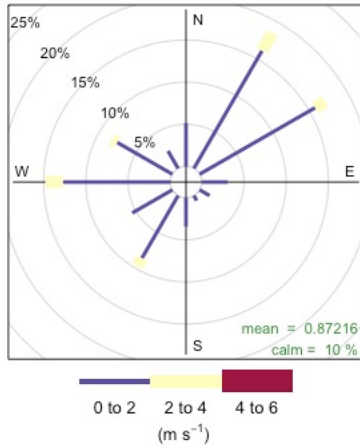
Supplementary Figure 16: **Variation of the effect of the marine factor at the Mountsorrel quarry between working and non-working hours.**

Polar plot of the estimated PM_{10} concentrations ($\mu g\ cm^{-3}$) for (a) non-working and (b) working hours of the marine factor (F3) at the Mountsorrel quarry site.

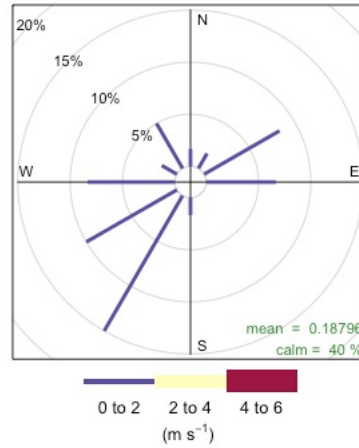


Supplementary Figure 17: **PNSD profiles of the clusters at the Mountsorrel quarry.**

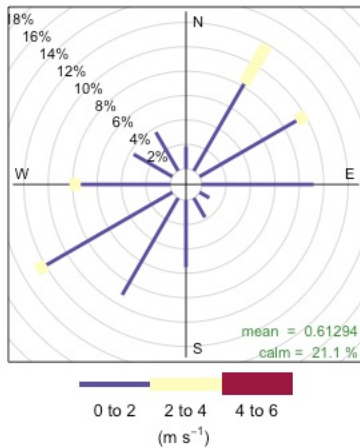
Particle Number Size Distribution profiles of the clusters from the k-means analysis at the Mountsorrel quarry site.



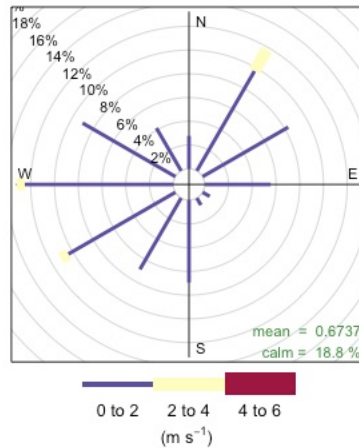
Frequency of counts by wind direction (%) **(a)**



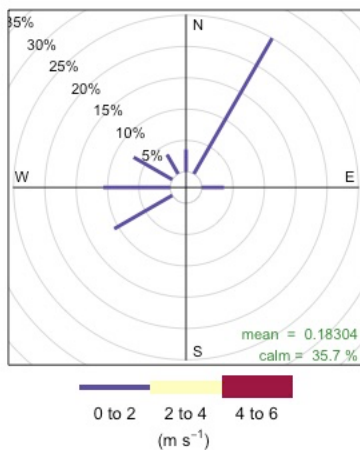
Frequency of counts by wind direction (%) **(b)**



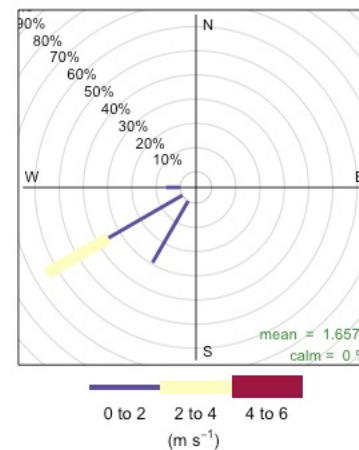
Frequency of counts by wind direction (%) **(c)**



Frequency of counts by wind direction (%) **(d)**



Frequency of counts by wind direction (%) **(e)**



Frequency of counts by wind direction (%) **(f)**

Supplementary Figure 18: **Wind profile of the clusters at the Mountsorrel quarry.**

Windroses of the clusters from the k-means analysis at the Mountsorrel quarry site. (a) refers to CL1, (b) refers to CL2, etc.

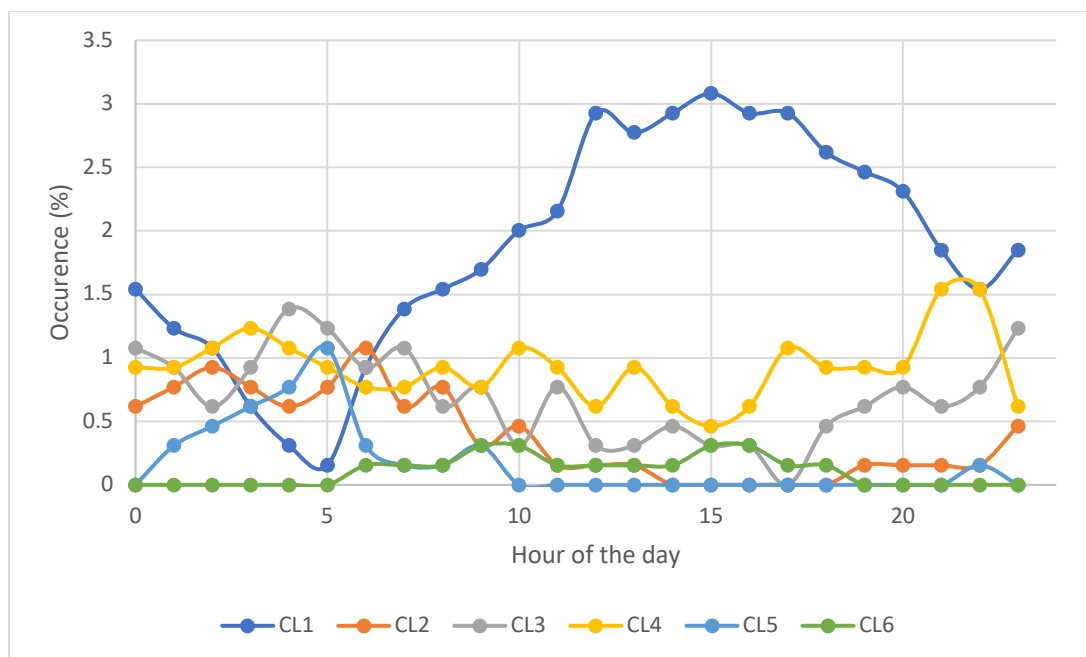
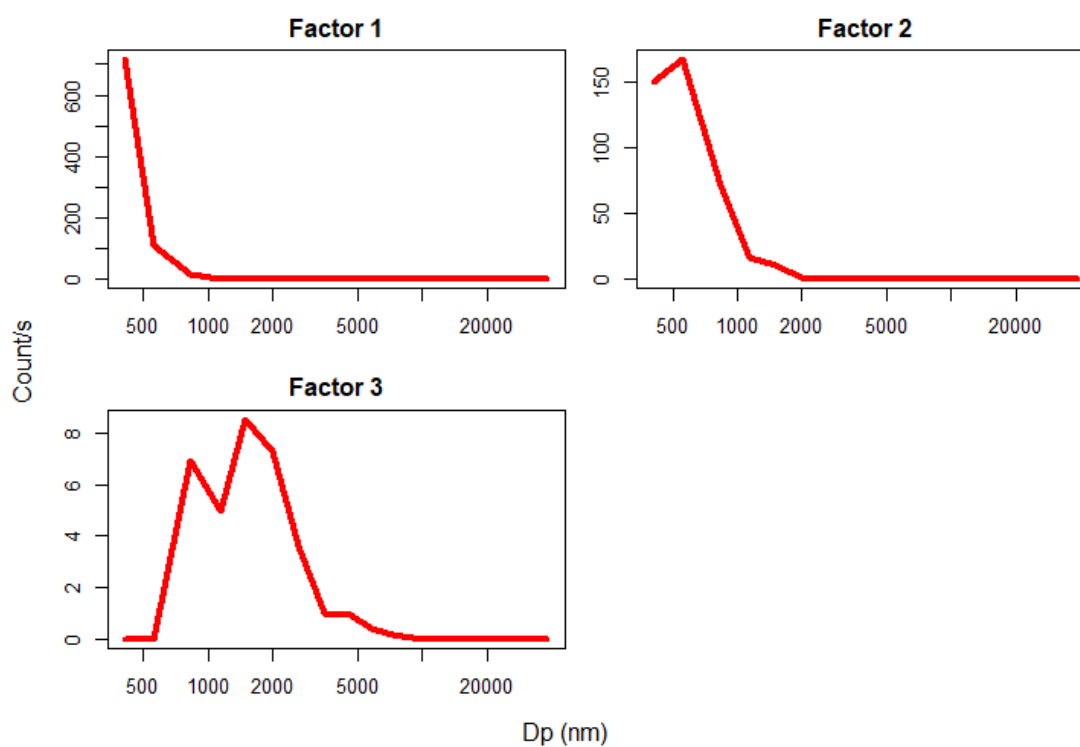


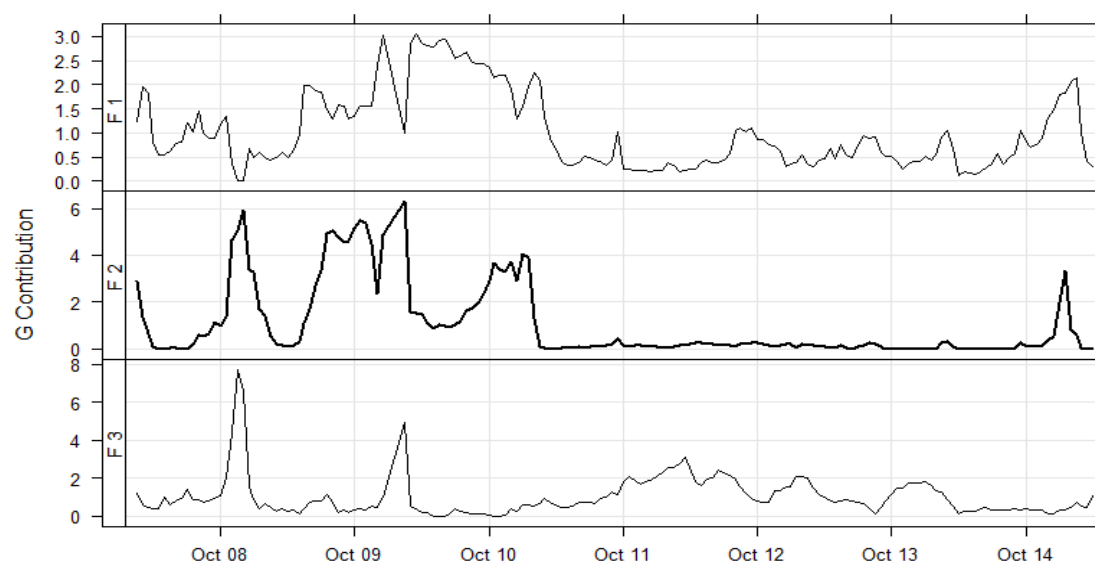
Figure S19: **Diurnal variation of the clusters at the Mountsorrel quarry.**

Diurnal variation of the clusters from the k-means analysis at the Mountsorrel quarry site.



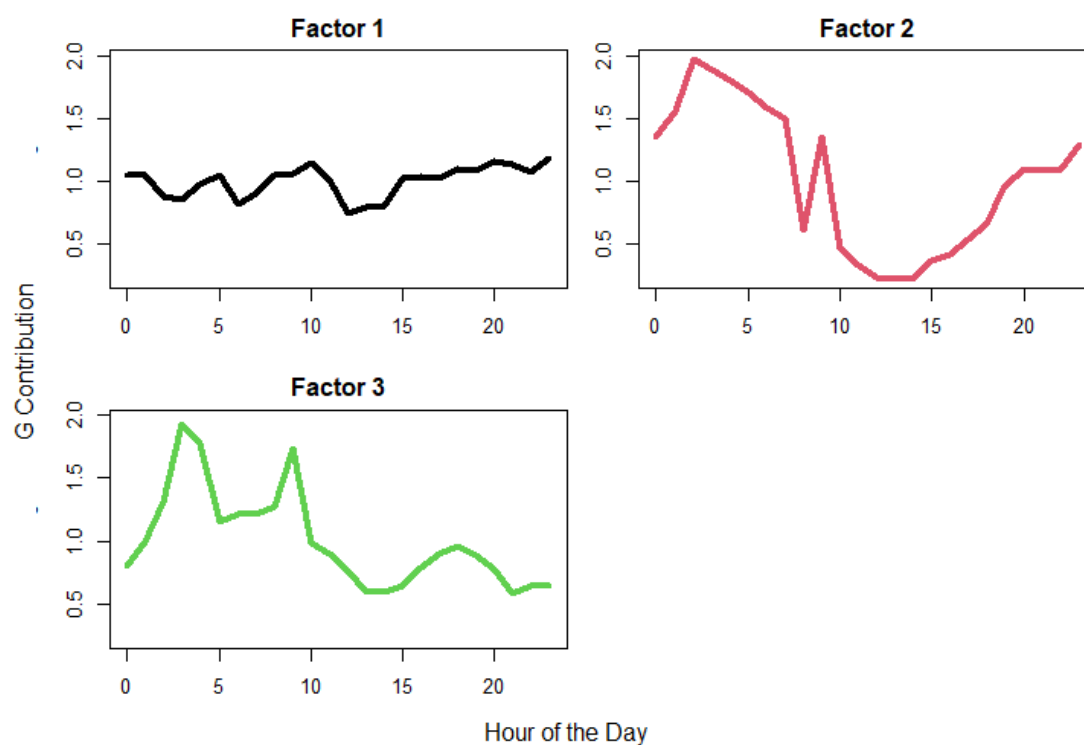
Supplementary Figure 20: **PNSD profiles of the factors at Charlbury**

Particle Number Size Distribution profiles of the factors from PMF analysis at the Charlbury roadside site.



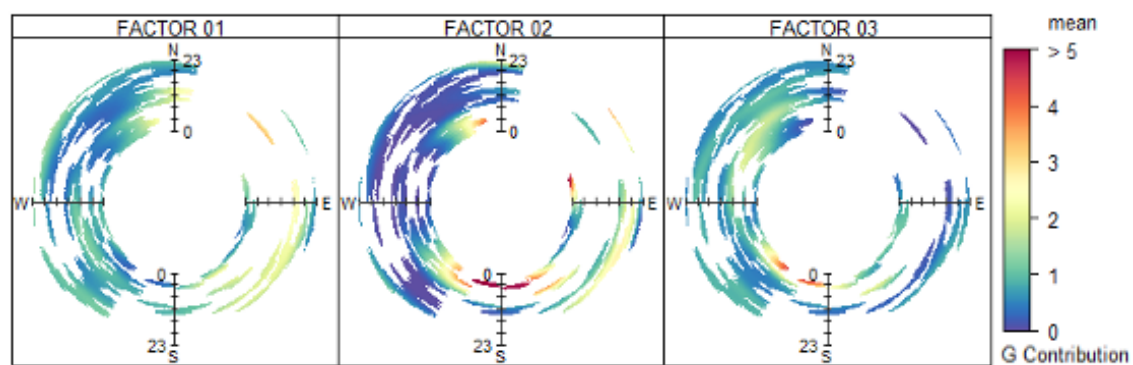
Supplementary Figure 21: **Temporal variation of the factors at Charlbury.**

Temporal variation of the G contribution of the factors from the PMF analysis at the Charlbury roadside site.



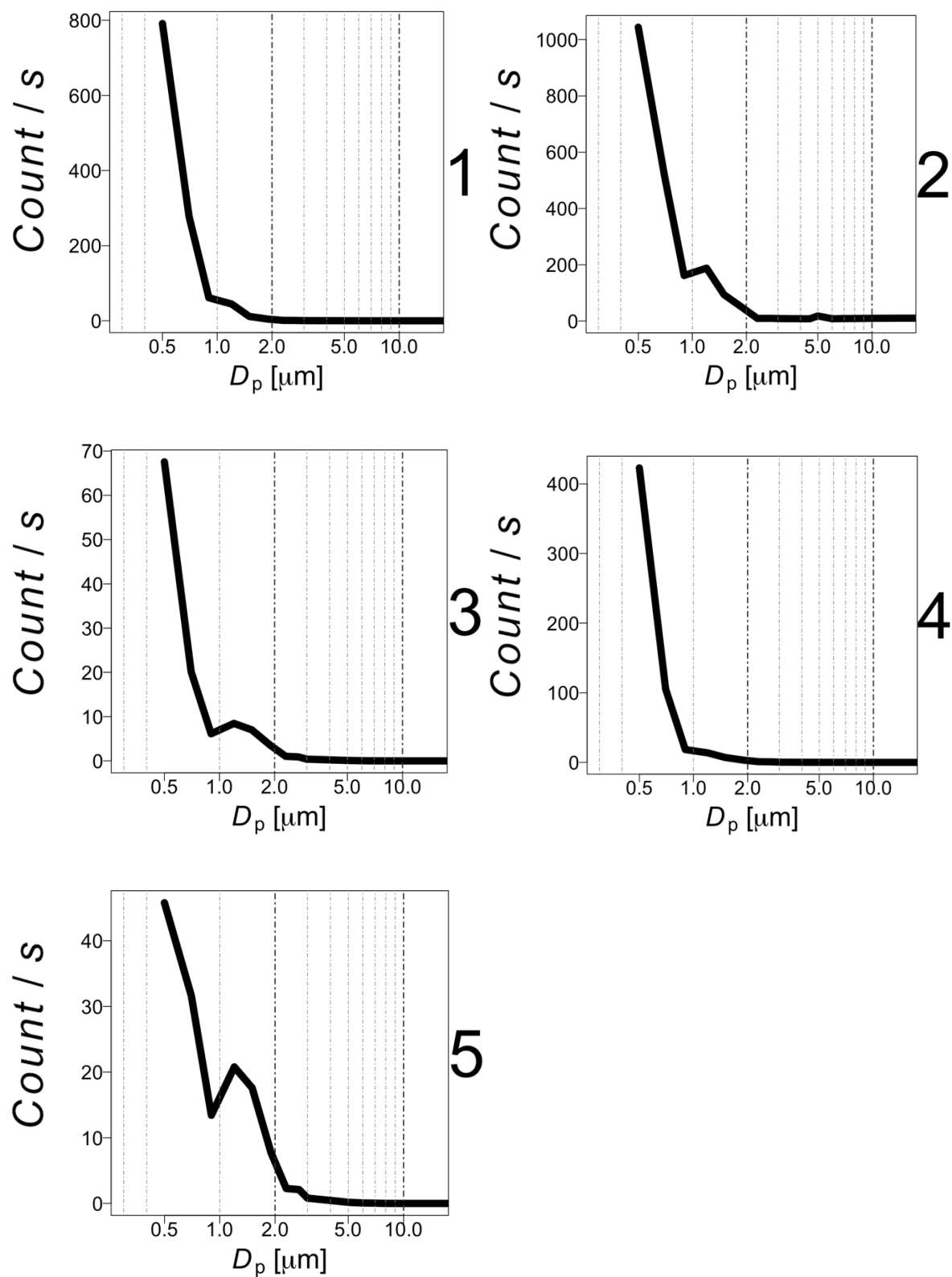
Supplementary Figure 22: **Diurnal variation of the factors at Charlbury.**

Diurnal variation of the G contribution of the factors from the PMF analysis at the Charlbury roadside site.



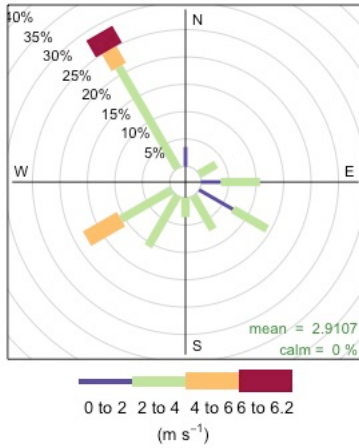
Supplementary Figure 23: **Variation of the factors' contribution at Charlbury.**

Polar annuli of the G contribution of the factors from the PMF analysis at the Charlbury roadside site.

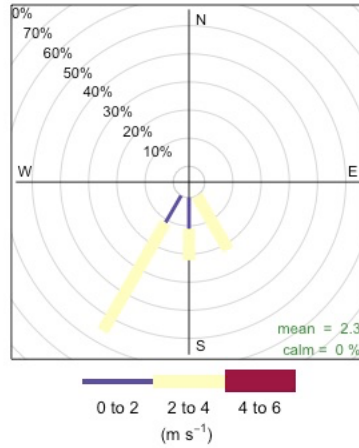


Supplementary Figure 24: **PNSD profiles of the clusters at Charlbury.**

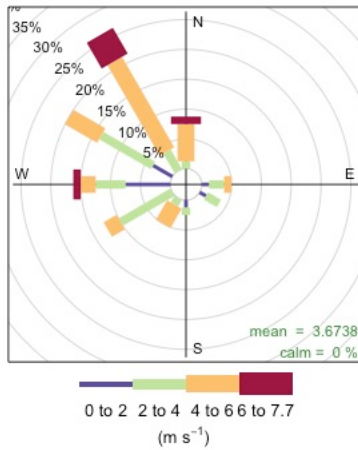
Particle Number Size Distribution profiles of the clusters from the k-means analysis (Charlbury roadside)



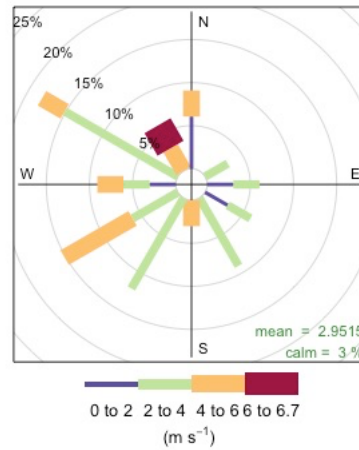
Frequency of counts by wind direction (%) **(a)**



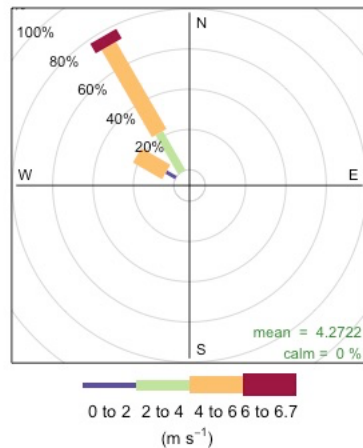
Frequency of counts by wind direction (%) **(b)**



Frequency of counts by wind direction (%) **(c)**



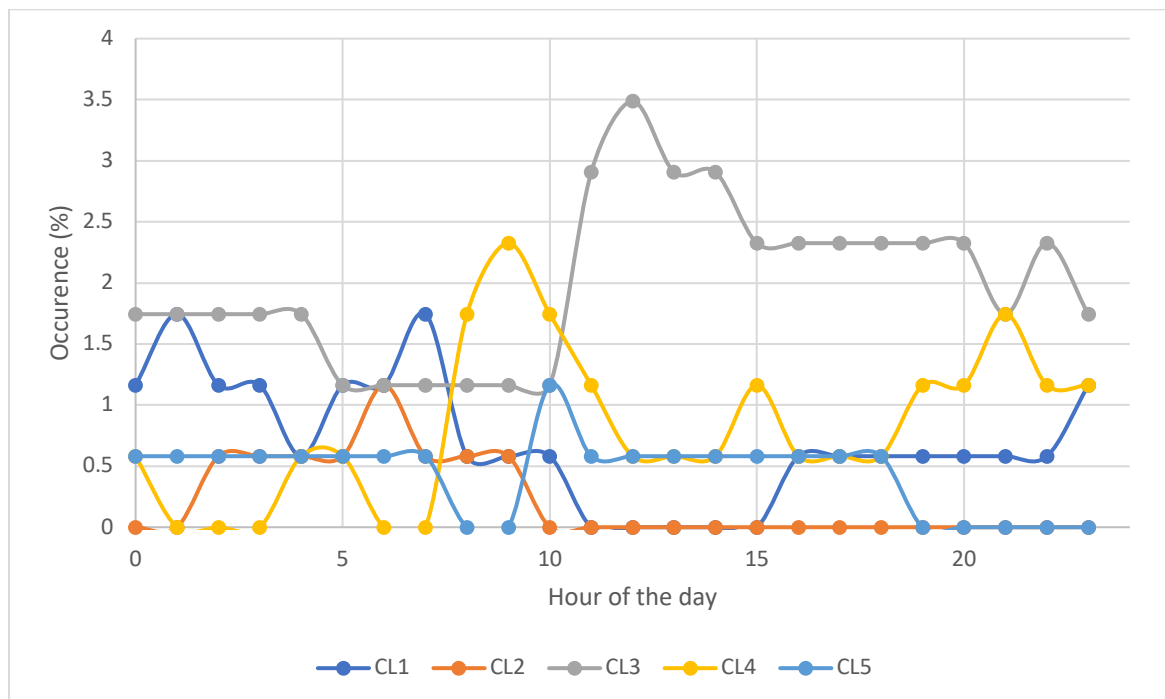
Frequency of counts by wind direction (%) **(d)**



Frequency of counts by wind direction (%) **(e)**

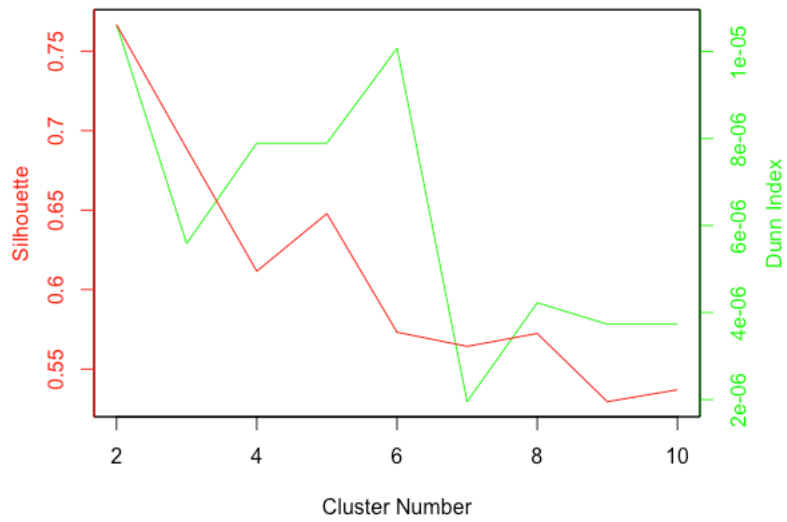
Supplementary Figure 25: **Wind profile of the clusters at Charlbury.**

Windroses of the clusters from the k-means analysis at the Charlbury roadside site. (a) refers to CL1, (b) to CL2, etc.

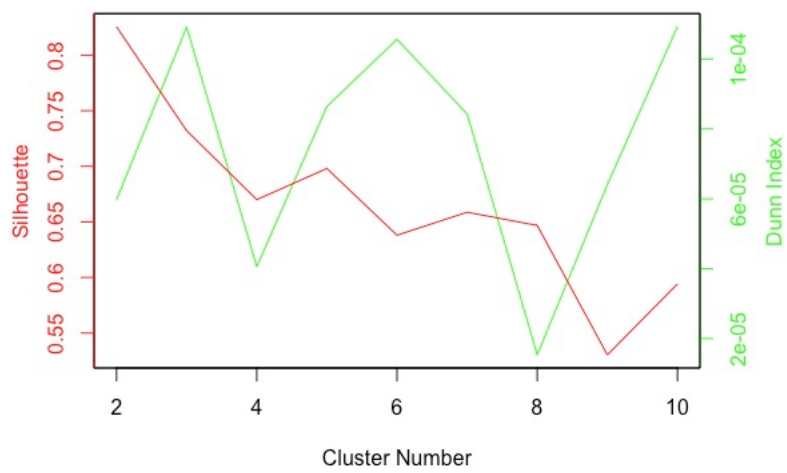


Supplementary Figure 26: **Diurnal variation of the clusters at Charlbury.**

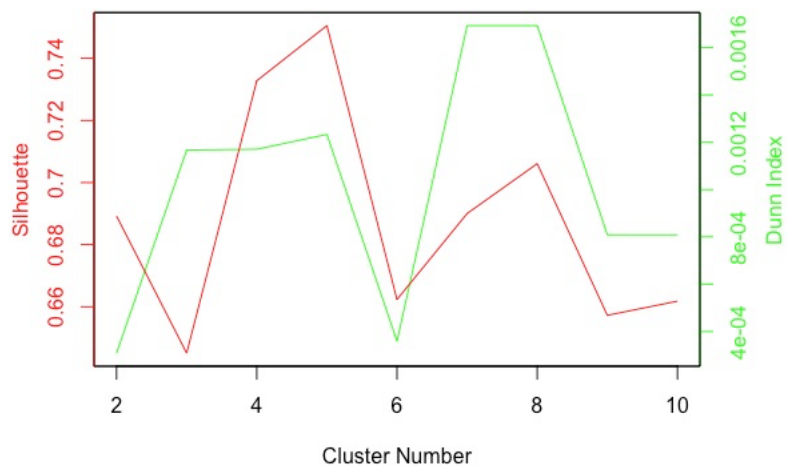
Diurnal variation of the clusters from the k-means analysis at the Charlbury roadside site.



(a)



(b)



(c)

Supplementary Figure 27: **Choosing the optimal number of clusters for the *k*-means clustering.**

The Dunn index and Silhouette width metrics for 2 to 10 cluster solution for (a) Curzon Street, (b) the Mountsorrel quarry and (c) the Charlbury roadside. The statistically optimal solution is the one for which both metrics are maximised. As this, in most cases, is not possible candidate solutions are chosen for which the model is tested. As an optimal solution, the one that better described the different sources and conditions in each case is chosen.