

Supplement of Atmos. Chem. Phys., 17, 867–881, 2017
<http://www.atmos-chem-phys.net/17/867/2017/>
doi:10.5194/acp-17-867-2017-supplement
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Atmospheric
Chemistry
and Physics
Open Access
EGU

Supplement of

The dynamical impact of Rossby wave breaking upon UK PM₁₀ concentration

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1 Improving the UK Midlands Dataset

It was suggested that justification for using a tri-site UK Midlands [PM10] dataset be sought. In generating the tri-site representative urban background PM10 dataset, a data validation step was undertaken. Supplement 1 justifies the application of this data verification step and the subsequent use of a tri-site PM10 dataset. Table S1 illustrates the Pearson's correlation coefficient values between three raw UK Midlands [PM10] datasets.

Table S1. Pearson's Correlation coefficients between unvalidated [PM10] datasets from the three urban background sites used in this study. The PM10 datasets are obtained between January 1999 and December 2008.

PM10 dataset	Birmingham Central	Leamington Spa	Leicester Central
Birmingham Central	1.0	0.73	0.86
Leamington Spa	0.73	1.0	0.74
Leicester Central	0.86	0.74	1.0

The UK Midlands [PM10] dataset in this study was formulated following a data validation step, which involved removing [PM10] tendency outliers from each dataset (See main text). Following data validation, the three datasets were averaged and a representative site was developed. Table S2 highlights the Pearson's correlation coefficient values between the three urban background [PM10] datasets, following the removal of data from each site after this study's data validation step.

Table S2. Pearson's Correlation coefficients between validated [PM10] datasets from the three urban background sites used in this study. The PM10 datasets are obtained between January 1999 and December 2008.

PM10 dataset	Birmingham Central	Leamington Spa	Leicester Central
Birmingham Central	1.0	0.86	0.87
Leamington Spa	0.86	1.0	0.86
Leicester Central	0.87	0.86	1.0

10 With the raised Pearson's correlation coefficient values between each PM10 dataset in Table S2, compared to Table S1, it is evident that the data validation improves the relationship between each of the three UK Midlands [PM10] datasets. The process was shown to most improve the relationship between the Leamington Spa urban background site and the remaining two sites. The Leamington Spa site was associated with many [PM10] spikes, caused by local PM10 sources or instrument malfunction. 11 % of the data at the Leamington Spa site has been removed following the data validation step, the greatest amount of any of the three sites.