Field Evaluation of Low-Cost PM Sensors (Purple Air PA-II) Under Variable Urban Air Quality Conditions, in Greece

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S1. Equations for performance assessment metrics and coefficient of divergence

\[ \text{RMSE (Root Mean Square Error)} = \sqrt{\frac{\sum_{i=1}^{n}(y_i - \hat{y})^2}{n}} \]

where \(y_i\) is the ith reference observation and \(\hat{y}\) is the predicted value produced by the model

\[ n\text{RMSE} = \frac{\text{RMSE}}{\bar{y}} \]

where \(\bar{y}\) is the mean value of reference observations for the given dataset

\[ \text{MAE (Mean Absolute Error)} = \frac{\sum_{i=1}^{n}|x_i - y_i|}{n} \]

where \(x_i\) is the ith PA-II measured or modeled value and \(y_i\) the corresponding reference measurement

\[ \text{MBE (Mean Bias Error)} = \frac{\sum_{i=1}^{n}(x_i - y_i)}{n} \]

where \(x_i\) is the ith PA-II or modeled value and \(y_i\) the corresponding reference measurement

\[ \text{CoD (Coefficient of Divergence)} = \sqrt{\frac{1}{n} \sum_{i=1}^{n} \left[ \frac{(x_{ij} - x_{ik})}{(x_{ij} + x_{ik})} \right]^2} \]

where \(x_i\) and \(x_k\) are concentrations at sites \(j\) and \(k\) respectively at time \(i\) and \(n\) is the total number of measurements.

S2. Field Intercomparison Campaigns

Table S1. Duration, reference site and number of participating PA-II devices at each intercomparison campaign held in Athens and Ioannina.

<table>
<thead>
<tr>
<th>Campaign Start</th>
<th>Campaign End</th>
<th>Reference Site</th>
<th>PA-II devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Athens Campaign</td>
<td>08/Mar/2019</td>
<td>Thissio (THI)</td>
<td>8</td>
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<tr>
<td>2nd Athens Campaign</td>
<td>03/Jul/2019</td>
<td>Thissio (THI)</td>
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<td>26/Feb/2020</td>
<td>Thissio (THI)</td>
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<tr>
<td>Ioannina Campaign</td>
<td>15/Dec/2019</td>
<td>Vilara (VIL)</td>
<td>1</td>
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S3. Description of the PA-II network in Athens and Ioannina

Figure S1. Maps of the PA-II network in Athens and Ioannina, displaying monitoring sites.
Table S2. Characteristics of the measurement locations in Athens and Ioannina during the two examined periods.

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Abbreviation</th>
<th>Device</th>
<th>Start Date</th>
<th>End date</th>
<th>Site Type *</th>
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<td>31 Aug 19</td>
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<td>GYZ</td>
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<td>31 Aug 19</td>
<td>UB</td>
</tr>
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<td>Pefki</td>
<td>PEF</td>
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<td>31 Aug 19</td>
<td>SB</td>
</tr>
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<td>31 Aug 19</td>
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<td>MEL</td>
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<td>31 Aug 19</td>
<td>SB</td>
</tr>
<tr>
<td>Chalandri</td>
<td>CHA</td>
<td>PA-005</td>
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<td>31 Aug 19</td>
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<tr>
<td>Vouliagmeni</td>
<td>VOU</td>
<td>PA-006</td>
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<td>31 Aug 19</td>
<td>SB</td>
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<td>Keratsini</td>
<td>KER</td>
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<td>31 Aug 19</td>
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<td>PA-015</td>
<td>15 Dec 19</td>
<td>15 Jan 20</td>
<td>UB</td>
</tr>
</tbody>
</table>

* UB: Urban Background, SB: Suburban Background.

Figure S2. External view of the Purple Air PA-II air monitor (a); upward view with the two Plantower PMS5003 sensors showing (b); the PMS5003 sensor with a breadboard adapter (c).

S4. Repeatability of PA-II PM$_{2.5}$ (CF=1), Temperature and Relative Humidity measurements

S4.1. PM$_{2.5}$ (CF=1)

Table S3. Pairwise correlations PM$_{2.5}$ (CF=1) measurements from the eight PA-II devices deployed at Thissio during the 1st intercomparison campaign in Athens.

<table>
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<th>PA_002</th>
<th>PA_003</th>
<th>PA_004</th>
<th>PA_005</th>
<th>PA_007</th>
<th>PA_008</th>
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</thead>
<tbody>
<tr>
<td>PA_000</td>
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<td></td>
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<td></td>
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<td></td>
</tr>
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<td>1.000</td>
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<td></td>
<td></td>
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<td></td>
</tr>
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<td>0.998</td>
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Figure S3. Scatterplots for pairwise comparisons of the eight collocated devices operating at Thisio, Athens, for a one-month period during the 1st intercomparison campaign. Displaying slopes for the ordinary least-squares fit.

S4.2. Temperature

Table S4. Pairwise correlations of temperature measurements from the eight PA-II devices deployed at Thisio during the 1st intercomparison campaign in Athens.

<table>
<thead>
<tr>
<th></th>
<th>PA_000</th>
<th>PA_001</th>
<th>PA_002</th>
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Table S5. Linear regression slopes for pairwise comparisons of temperature measurements between eight devices deployed at Thisio during the 1st intercomparison campaign in Athens.

<table>
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<th>Slope</th>
<th>PA_000</th>
<th>PA_001</th>
<th>PA_002</th>
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<th>PA_004</th>
<th>PA_005</th>
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S4.3. Relative Humidity

Table S6. Pairwise correlations of RH measurements from the eight PA-II devices deployed at Thissio during the 1st intercomparison campaign in Athens.

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<th>PA_004</th>
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Table S7. Linear regression slopes for pairwise comparisons of RH measurements between eight devices deployed at Thissio during the 1st intercomparison campaign in Athens.

<table>
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<th>Slope</th>
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</table>

S4.4 Temperature and Relative humidity sensor calibration

Figure S4. Linear regression of reference T (left) and RH (right) versus T and RH measured by the BME280 sensor of the PA-II device.
S5. PA-II PM$_{2.5}$(CF=1) measurement error

**Figure S5.** Scatterplots of the PA-ii PM$_{2.5}$(CF=1) absolute error versus reference PM$_{2.5}$ measurements in Ioannina (left) and Athens (right). Plots are color-coded according to ambient relative humidity.

**Figure S6.** PA-II PM$_{2.5}$(CF=1) MAE as a function of binned RH measurements at Thissio (left) and Ioannina (right).
Figure S7. Bias error examination for Ioannina (a, b, c) and Athens (d, e, f). The bias error \((\text{PM}_{2.5}(\text{CF}=1) - \text{Ref})\) versus reference \(\text{PM}_{2.5}\) are depicted in (a) and (d) color-coded by the \(\text{PM}_1/\text{PM}_{2.5}\) ratio. The bias error versus RH, color-coded by the reference \(\text{PM}_{2.5}\) can be seen in (b) and (e), while boxplots of mean bias error for 10% RH increments are depicted in (c) and (f).
S6. Coarse mode affected data according to the PM$_{2.5}$/PM$_{10}$ ratio

Figure S8. In order to determine and fine-tune a threshold, useful in excluding data affected by the presence of coarse mode particles, we use the PM$_{2.5}$/PM$_{10}$ ratio, given that these two fractions are more frequently part of routine measurements at regulatory AQS. We analyze the springtime Ioannina dataset for calculations. Initially all data points are used to perform linear regression to reference measurements, followed by the gradual exclusion of data points with ratios lower than 0.05. Each time, this number is increased by 0.05 and linear regression is performed with the remaining data. The top panel illustrates the linear regression $R^2$, as well as the number of remaining data-points, as a function of the data exclusion PM$_{2.5}$/PM$_{10}$ threshold. Finally, a PM$_{2.5}$/PM$_{10}$ ratio of 0.5 is selected as the exclusion threshold, as a trade-off between high $R^2$ without excluding much of the initial dataset.
S7. Base and Evaluation Data split

Figure S9. Bar plot of the ambient PM$_{2.5}$ time-series recorded in Ioannina. Orange bars represent data selected for the base dataset while blue represent evaluation data.

Figure S10. Bar plots of the PA-II PM$_{2.5}$\(\text{(CF=1)}\) time-series recorded in Athens during the 1st and 2nd intercomparison campaigns. Orange bars represent data selected for the base dataset while blue represent evaluation data.

S8. Calibration Models for the Ioannina dataset

Table S8. Configuration of the PA-II PM$_{2.5}$\(\text{(CF=1)}\) correction models tested for the Ioannina dataset. The numbers represent the polynomial degree assigned to the corresponding predictor.

<table>
<thead>
<tr>
<th>Ioannina</th>
<th>iModel 1</th>
<th>iModel 2</th>
<th>iModel 3</th>
<th>iModel 4</th>
<th>iModel 5</th>
<th>iModel 6</th>
<th>iModel 7</th>
<th>iModel 8</th>
<th>iModel 9</th>
<th>iModel 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM$_{2.5}$(\text{(CF=1)})</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>PM$<em>{1}$/PM$</em>{2.5}$</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PM$<em>{2.5}$/PM$</em>{10}$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>RH</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
- iModel 1: $PM_{2.5,cor} = 0.550 \times PM_{2.5(CF=1)} - 0.244$
- iModel 2: $PM_{2.5,cor} = 0.000387 \times PM_{2.5(CF=1)}^2 + 0.443 \times PM_{2.5(CF=1)} + 2.60$
- iModel 3: $PM_{2.5,cor} = 22.2 + 0.570 \times PM_{2.5(CF=1)} - 27.1 \times \frac{PM_1}{PM_{2.5}}$
- iModel 4: $PM_{2.5,cor} = 11.7 + 1.13 \times PM_{2.5(CF=1)} - 12.8 \times \frac{PM_1}{PM_{2.5}} + 0.000348 \times PM_{2.5(CF=1)}^2 - 0.683 \times PM_{2.5(CF=1)} \times \frac{PM_1}{PM_{2.5}}$
- iModel 5: $PM_{2.5,cor} = 14.5 + 0.579 \times PM_{2.5(CF=1)} - 21.9 \times \frac{PM_{2.5}}{PM_{10}}$
- iModel 6: $PM_{2.5,cor} = 8.49 + 0.7301 \times PM_{2.5(CF=1)} - 10.8 \times \frac{PM_{2.5}}{PM_{10}} + 0.000334 \times PM_{2.5(CF=1)}^2 - 0.276 \times PM_{2.5(CF=1)} \times \frac{PM_{2.5}}{PM_{10}}$
- iModel 7: $PM_{2.5,cor} = 25.9 + 0.578 \times PM_{2.5(CF=1)} - 0.09245 \times RH - 24.6 \times \frac{PM_1}{PM_{2.5}}$
- iModel 8: $PM_{2.5,cor} = -10.0 \times \frac{PM_1}{PM_{2.5}} - 0.0386 \times RH + 0.00466 \times RH \times \frac{PM_1}{PM_{2.5}} + 1.483 \times PM_{2.5(CF=1)} - 0.940 \times PM_{2.5(CF=1)} \times \frac{PM_1}{PM_{2.5}} - 0.00131 \times PM_{2.5(CF=1)} \times RH + 10.9 + 0.000339 \times PM_{2.5(CF=1)}^2$
- iModel 9: $PM_{2.5,cor} = 16.8 + 0.581 \times PM_{2.5(CF=1)} - 0.0720 \times RH - 18.5 \times \frac{PM_{2.5}}{PM_{10}}$
- iModel 10: $PM_{2.5,cor} = -9.055 \times \frac{PM_{2.5}}{PM_{10}} + 0.00267 \times RH - 0.02528 \times RH \times \frac{PM_{2.5}}{PM_{10}} + 0.745 \times PM_{2.5(CF=1)} - 0.203 \times PM_{2.5(CF=1)} \times \frac{PM_{2.5}}{PM_{10}} - 0.000961 \times PM_{2.5(CF=1)} \times RH + 8.34 + 0.000310 \times PM_{2.5(CF=1)}^2$

**Table S9.** Goodness-of-fit metrics for all tested models in the base dataset for the Ioannina intercomparison campaign.

<table>
<thead>
<tr>
<th>Ioannina</th>
<th>iModel 1</th>
<th>iModel 2</th>
<th>iModel 3</th>
<th>iModel 4</th>
<th>iModel 5</th>
<th>iModel 6</th>
<th>iModel 7</th>
<th>iModel 8</th>
<th>iModel 9</th>
<th>iModel 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>0.976</td>
<td>0.983</td>
<td>0.983</td>
<td>0.987</td>
<td>0.982</td>
<td>0.985</td>
<td>0.991</td>
<td>0.984</td>
<td>0.988</td>
<td></td>
</tr>
<tr>
<td>nRMSE</td>
<td>0.198</td>
<td>0.166</td>
<td>0.169</td>
<td>0.144</td>
<td>0.170</td>
<td>0.153</td>
<td>0.154</td>
<td>0.118</td>
<td>0.161</td>
<td>0.139</td>
</tr>
<tr>
<td>MAE (μg m⁻³)</td>
<td>3.8</td>
<td>3.1</td>
<td>3.5</td>
<td>2.8</td>
<td>3.6</td>
<td>3.0</td>
<td>3.0</td>
<td>2.3</td>
<td>3.4</td>
<td>2.8</td>
</tr>
</tbody>
</table>
S9. Dust events identified at Ioannina and model response

S9.1. PSCF analysis

Figure S11. PSCF analysis (75th percentile of concentrations) performed using 120-hour back trajectories arriving at a height of 1000 m every 6 hours and PM$_{10-2.5}$ reference concentrations during December 20-22 2019 (left) and May 11-21 2020 (right).

S9.2. December 20-22 2019 dust-transport event

Table S10. Model performance metrics along with basic PM$_{2.5}$c statistics (model corrected concentrations) for the December dust event.

<table>
<thead>
<tr>
<th></th>
<th>$R^2$</th>
<th>Slope</th>
<th>Intercept</th>
<th>Mean</th>
<th>St Dev</th>
<th>MAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>iModel1</td>
<td>0.774</td>
<td>1.424</td>
<td>6.057</td>
<td>22.2</td>
<td>15.3</td>
<td>15.8</td>
</tr>
<tr>
<td>iModel2</td>
<td>0.772</td>
<td>1.597</td>
<td>3.206</td>
<td>21.6</td>
<td>13.6</td>
<td>16.2</td>
</tr>
<tr>
<td>iModel3</td>
<td>0.904</td>
<td>1.542</td>
<td>-7.361</td>
<td>29.3</td>
<td>15.2</td>
<td>8.8</td>
</tr>
<tr>
<td>iModel4</td>
<td>0.940</td>
<td>1.188</td>
<td>-2.026</td>
<td>33.5</td>
<td>20.2</td>
<td>5.3</td>
</tr>
<tr>
<td>iModel5</td>
<td>0.875</td>
<td>1.451</td>
<td>-0.520</td>
<td>26.4</td>
<td>16.0</td>
<td>11.5</td>
</tr>
<tr>
<td>iModel6</td>
<td>0.877</td>
<td>1.347</td>
<td>1.200</td>
<td>27.1</td>
<td>17.2</td>
<td>10.9</td>
</tr>
<tr>
<td>iModel7</td>
<td>0.905</td>
<td>1.541</td>
<td>-2.846</td>
<td>26.4</td>
<td>15.3</td>
<td>11.4</td>
</tr>
<tr>
<td>iModel8</td>
<td>0.954</td>
<td>1.094</td>
<td>0.507</td>
<td>34.0</td>
<td>22.1</td>
<td>4.7</td>
</tr>
<tr>
<td>iModel9</td>
<td>0.869</td>
<td>1.454</td>
<td>2.817</td>
<td>24.0</td>
<td>15.9</td>
<td>13.3</td>
</tr>
<tr>
<td>iModel10</td>
<td>0.876</td>
<td>1.448</td>
<td>0.960</td>
<td>25.4</td>
<td>16.0</td>
<td>12.4</td>
</tr>
</tbody>
</table>
Table S11. Model performance metrics along with basic PM$_{2.5cor}$ statistics (model corrected concentrations) for the May dust event.

<table>
<thead>
<tr>
<th>Model</th>
<th>$R^2$</th>
<th>Slope</th>
<th>Intercept</th>
<th>Mean</th>
<th>Std Dev</th>
<th>MAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>iModel1</td>
<td>0.464</td>
<td>1.747</td>
<td>-5.594</td>
<td>4.9</td>
<td>2.7</td>
<td>9.3</td>
</tr>
<tr>
<td>iModel2</td>
<td>0.463</td>
<td>2.128</td>
<td>-0.285</td>
<td>6.8</td>
<td>2.2</td>
<td>7.4</td>
</tr>
<tr>
<td>iModel3</td>
<td>0.899</td>
<td>1.822</td>
<td>-12.789</td>
<td>14.8</td>
<td>3.6</td>
<td>3.3</td>
</tr>
<tr>
<td>iModel4</td>
<td>0.891</td>
<td>1.627</td>
<td>-7.245</td>
<td>13.2</td>
<td>4.0</td>
<td>3.0</td>
</tr>
<tr>
<td>iModel5</td>
<td>0.682</td>
<td>2.155</td>
<td>-11.867</td>
<td>12.1</td>
<td>2.6</td>
<td>4.5</td>
</tr>
<tr>
<td>iModel6</td>
<td>0.655</td>
<td>1.960</td>
<td>-6.461</td>
<td>10.5</td>
<td>2.8</td>
<td>4.6</td>
</tr>
<tr>
<td>iModel7</td>
<td>0.674</td>
<td>1.470</td>
<td>-8.809</td>
<td>15.6</td>
<td>3.9</td>
<td>3.6</td>
</tr>
<tr>
<td>iModel8</td>
<td>0.890</td>
<td>1.427</td>
<td>-5.246</td>
<td>13.6</td>
<td>4.6</td>
<td>2.6</td>
</tr>
<tr>
<td>iModel9</td>
<td>0.571</td>
<td>1.919</td>
<td>-9.617</td>
<td>12.4</td>
<td>2.7</td>
<td>4.7</td>
</tr>
<tr>
<td>iModel10</td>
<td>0.677</td>
<td>2.033</td>
<td>-7.423</td>
<td>10.6</td>
<td>2.8</td>
<td>4.6</td>
</tr>
</tbody>
</table>

Table S12. Configuration of the PA-II PM$_{2.5(CF=1)}$ correction models tested for the Athens dataset. The numbers represent the polynomial degree assigned to the corresponding predictor.

<table>
<thead>
<tr>
<th>Athens</th>
<th>aModel 1*</th>
<th>aModel 2</th>
<th>aModel 3</th>
<th>aModel 4</th>
<th>aModel 5</th>
<th>aModel 6*</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM$_{2.5(CF=1)}$</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>PM$<em>1$/PM$</em>{2.5}$</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PM$<em>{2.5}$/PM$</em>{10}$</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>RH</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

* Data for both intercomparison campaigns are used for aModel 1 and aModel 6.

- **aModel 1**: $PM_{2.5cor} = 0.449 \times PM_{2.5(CF=1)} + 6.72$
- **aModel 2**: $PM_{2.5cor} = 22.5 + 0.491 \times PM_{2.5(CF=1)} - 17.5 \times \frac{PM_1}{PM_{2.5}}$
- **aModel 3**: $PM_{2.5cor} = 14.1 + 0.492 \times PM_{2.5(CF=1)} - 9.76 \times \frac{PM_{2.5}}{PM_{10}}$
- **aModel 4**: $PM_{2.5cor} = 20.3 + 0.485 \times PM_{2.5(CF=1)} + 0.0481 \times RH - 17.5 \times \frac{PM_1}{PM_{2.5}}$
- **aModel 5**: $PM_{2.5cor} = 11.8 + 0.487 \times PM_{2.5(CF=1)} + 0.0675 \times RH - 10.9 \times \frac{PM_{2.5}}{PM_{10}}$
- **aModel 6**: $PM_{2.5cor} = 9.32 + 0.464 \times PM_{2.5(CF=1)} - 0.0574 \times RH$

Table S13. Goodness of fit metrics for all tested models on the base dataset for the Athens intercomparison campaigns.

<table>
<thead>
<tr>
<th>Athens</th>
<th>aModel 1*</th>
<th>aModel 2</th>
<th>aModel 3</th>
<th>aModel 4</th>
<th>aModel 5</th>
<th>aModel 6*</th>
</tr>
</thead>
<tbody>
<tr>
<td>R$^2$</td>
<td>0.831</td>
<td>0.841</td>
<td>0.834</td>
<td>0.846</td>
<td>0.843</td>
<td>0.852</td>
</tr>
<tr>
<td>nRMSE</td>
<td>0.197</td>
<td>0.172</td>
<td>0.176</td>
<td>0.170</td>
<td>0.171</td>
<td>0.185</td>
</tr>
<tr>
<td>MAE ($\mu g \cdot m^{-3}$)</td>
<td>2.4</td>
<td>1.9</td>
<td>2.0</td>
<td>1.9</td>
<td>2.0</td>
<td>2.1</td>
</tr>
</tbody>
</table>

* Data for both intercomparison campaigns are used for aModel 1 and aModel 6.
S11. Temperature and Relative Humidity during the Athens intercomparison campaigns

Table S14. Mean and Standard Deviation of Temperature and Relative Humidity in Thissio during the Athens intercomparison campaigns.

<table>
<thead>
<tr>
<th>Period</th>
<th>Temperature (°C)</th>
<th>Relative Humidity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mean  stdev</td>
<td>Mean Stdev</td>
</tr>
<tr>
<td>Warm</td>
<td>29.0  3.6</td>
<td>46.7  11.0</td>
</tr>
<tr>
<td>Cold</td>
<td>13.2  3.2</td>
<td>60.6  14.6</td>
</tr>
<tr>
<td>Intermediate</td>
<td>19.5  4.9</td>
<td>47.6  13.4</td>
</tr>
</tbody>
</table>

Figure S12. Diurnal variability of Temperature and Relative Humidity at Thissio during the Warm, Cold and Intermediate identified periods of the 2nd and 3rd Athens intercomparison campaigns.
S12. Chemical Composition of Submicron Aerosols during the Athens intercomparison campaigns

Figure S13. Chemical composition of PM1 aerosol in Athens during the different periods 2nd and 3rd intercomparison campaigns. Non-Refractory PM1 species were quantified using an Aerodyne ACSM operated at Thissio while BC components (BCf and BCff) were apportioned using the Aethalometer Model on measurements conducted with an AE-33 aethalometer.
Figure S14. Scatter plots of PA-II PM$_{2.5}$core absolute error versus BC$_{ff}$ BC$_{wb}$ and SO$_4^{2-}$ concentrations for the warm (a-c), cold (d-f) and intermediate (g-i) seasons in Athens during the 2nd and 3rd intercomparison periods combined.
Figure S15. Satellite image (MODIS) of Greece on 13 August 2019 (top), with the active forest fire region and the plume over the Athens basin (https://go.nasa.gov/2YIHqly). On the bottom an image during the following day, when fire activity has declined (https://go.nasa.gov/31qOEMX).
Figure S16. Spatial evolution of the Euboea forest fire’s impact on PM$_{2.5}$ concentrations over the Athens basin, as estimated by nearest neighbor interpolation on a 0.01° resolution grid (August 13th, 2019).
S14. Spatial Variability in Athens and Ioannina

Table S15. Pairwise correlations of PM$_{2.5}$ measurements at sites in Athens during August 2019.

<table>
<thead>
<tr>
<th>R$^2$</th>
<th>GYZ</th>
<th>PEF</th>
<th>PIR</th>
<th>MEL</th>
<th>HAL</th>
<th>VOU</th>
<th>KER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PA_001</td>
<td>0.91</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GYZ</td>
<td>PA_002</td>
<td>0.80</td>
<td>0.89</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEF</td>
<td>PA_003</td>
<td>0.82</td>
<td>0.78</td>
<td>0.74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIR</td>
<td>PA_004</td>
<td>0.80</td>
<td>0.86</td>
<td>0.94</td>
<td>0.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MEL</td>
<td>PA_005</td>
<td>0.86</td>
<td>0.89</td>
<td>0.92</td>
<td>0.74</td>
<td>0.88</td>
<td></td>
</tr>
<tr>
<td>HAL</td>
<td>PA_006</td>
<td>0.73</td>
<td>0.85</td>
<td>0.79</td>
<td>0.71</td>
<td>0.78</td>
<td>0.82</td>
</tr>
<tr>
<td>VOU</td>
<td>PA_007</td>
<td>0.84</td>
<td>0.81</td>
<td>0.80</td>
<td>0.87</td>
<td>0.77</td>
<td>0.76</td>
</tr>
<tr>
<td>KER</td>
<td>PA_014</td>
<td>0.84</td>
<td>0.81</td>
<td>0.801</td>
<td>0.83</td>
<td>0.77</td>
<td>0.77</td>
</tr>
</tbody>
</table>

Table S16. Coefficient of Divergence (CoD) values for each pair of monitoring sites in Ioannina during the 1-month wintertime campaign.

<table>
<thead>
<tr>
<th>CoD</th>
<th>ANA</th>
<th>VIL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PA_013</td>
<td>PA_015</td>
</tr>
<tr>
<td>GYZ</td>
<td>PA_015</td>
<td>0.24</td>
</tr>
<tr>
<td>VIL</td>
<td>PA_016</td>
<td>0.33</td>
</tr>
</tbody>
</table>

Table S17. Pairwise correlations of PM$_{2.5}$ measurements at sites in Ioannina during the 1-month wintertime campaign.

<table>
<thead>
<tr>
<th>R$^2$</th>
<th>ANA</th>
<th>VIL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PA_013</td>
<td>PA_015</td>
</tr>
<tr>
<td>VIL</td>
<td>PA_015</td>
<td>0.73</td>
</tr>
<tr>
<td>GIR</td>
<td>PA_016</td>
<td>0.66</td>
</tr>
</tbody>
</table>