**Regression subsetting results**

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| --- | --- | --- | --- | --- | --- |
| **Region** | **All** | **West** | **East** | **Central** | **Central 2** |
| PM25 [ug/m3]  Median/Max | 9.5/167.3 | 10.5/167.3 | 7.6/32.7 | 6.6/21.27 | 10.07/33.84 |
| N | 7,016 | 3,313 | 329 | 610 | 1721 |
| **R2** Linear Reg. PM25-AOD550 | 0.16 | 0.18 | 0.55 | 0.15 | 0.28 |
| **RMSE** Linear Reg. PM25-AOD550 | 9.44 | 11.69 | 3.61 | 3.11 | 4.52 |
| **R2** Regsub with interactions | 0.48 | 0.63 | 0.71 | 0.42 | 0.46 |
| **RMSE** Regsub with interactions | 7.36 | 7.85 | 3.09 | 2.60 | 3.89 |
| **R2** Regsub with interactions NO AOD | 0.47 | 0.62 | 0.69 | 0.41 | 0.44 |
| **RMSE** Regsub with interactions NO AOD | 7.41 | 7.88 | 3.09 | 2.61 | 3.96 |

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| **Contributing variables with AOD**  **(out of a maximum of 20 items in the regression equation)** | [1] "`AOD[440nm]`"  [2] "`AOD[1020nm]`"  [3] "`Angstrom\_Exponent\_440-870nm\_from\_Coincident\_Input\_AOD`"  [4] "`AOD\_Extinction-Fine[440nm]`"  [5] "`AOD\_Extinction-Fine[675nm]`"  [6] "`AOD\_Extinction-Fine[1020nm]`"  [7] "`Asymmetry\_Factor-Fine[440nm]`"  [8] "`Asymmetry\_Factor-Coarse[440nm]`"  [9] "`Asymmetry\_Factor-Coarse[675nm]`"  [10] "`Asymmetry\_Factor-Coarse[1020nm]`"  [11] "`REff-T`"  [12] "`REff-F`"  [13] "`REff-C`"  [14] "`AOD[550nm]`"  [15] "`Asymmetry\_Factor-Coarse[675nm]`:`REff-C`"  [16] "`REff-F`:`440-675\_Angstrom\_Exponent`"  [17] "`Asymmetry\_Factor-Fine[675nm]`:`440-675\_Angstrom\_Exponent`" | [1] "`AOD[440nm]`"  [2] "`AOD[1020nm]`"  [3] "`Angstrom\_Exponent\_440-870nm\_from\_Coincident\_Input\_AOD`"  [4] "`AOD\_Extinction-Fine[675nm]`"  [5] "`AOD\_Extinction-Coarse[440nm]`"  [6] "`Asymmetry\_Factor-Fine[675nm]`"  [7] "`Asymmetry\_Factor-Coarse[440nm]`"  [8] "`Asymmetry\_Factor-Coarse[675nm]`"  [9] "`Asymmetry\_Factor-Coarse[870nm]`"  [10] "`Asymmetry\_Factor-Coarse[1020nm]`"  [11] "`REff-T`"  [12] "`REff-C`"  [13] "`AOD[550nm]`"  [14] "`440-675\_Angstrom\_Exponent`"  [15] "`REff-C`:`440-675\_Angstrom\_Exponent`"  [16] "`Asymmetry\_Factor-Coarse[675nm]`:`440-675\_Angstrom\_Exponent`"  [17] "`Asymmetry\_Factor-Coarse[675nm]`:`REff-C`"  [18] "`REff-F`:`440-675\_Angstrom\_Exponent`"  [19] "`Asymmetry\_Factor-Fine[675nm]`:`440-675\_Angstrom\_Exponent`"  [20] "`Asymmetry\_Factor-Fine[675nm]`:`REff-F`" | [1] "`AOD[440nm]`"  [2] "`AOD[675nm]`"  [3] "`AOD[870nm]`"  [4] "`AOD[1020nm]`"  [5] "`AOD\_Extinction-Fine[440nm]`"  [6] "`AOD\_Extinction-Fine[1020nm]`"  [7] "`AOD\_Extinction-Coarse[440nm]`"  [8] "`AOD\_Extinction-Coarse[675nm]`"  [9] "`Asymmetry\_Factor-Fine[870nm]`"  [10] "`Asymmetry\_Factor-Fine[1020nm]`"  [11] "`Asymmetry\_Factor-Coarse[675nm]`"  [12] "`Asymmetry\_Factor-Coarse[870nm]`"  [13] "`Asymmetry\_Factor-Coarse[1020nm]`"  [14] "`REff-T`"  [15] "`REff-C`"  [16] "`AOD[550nm]`"  [17] "`Asymmetry\_Factor-Coarse[675nm]`:`REff-C`"  [18] "`REff-F`:`440-675\_Angstrom\_Exponent`"  [19] "`Asymmetry\_Factor-Fine[675nm]`:`440-675\_Angstrom\_Exponent`" | [1] "`AOD[440nm]`"  [2] "`AOD[675nm]`"  [3] "`AOD\_Extinction-Fine[440nm]`"  [4] "`AOD\_Extinction-Fine[675nm]`"  [5] "`AOD\_Extinction-Fine[1020nm]`"  [6] "`AOD\_Extinction-Coarse[440nm]`"  [7] "`AOD\_Extinction-Coarse[675nm]`"  [8] "`AOD\_Extinction-Coarse[1020nm]`"  [9] "`Asymmetry\_Factor-Fine[440nm]`"  [10] "`Asymmetry\_Factor-Fine[675nm]`"  [11] "`Asymmetry\_Factor-Coarse[675nm]`"  [12] "`Asymmetry\_Factor-Coarse[870nm]`"  [13] "`Asymmetry\_Factor-Coarse[1020nm]`"  [14] "`REff-F`"  [15] "`REff-C`:`440-675\_Angstrom\_Exponent`"  [16] "`Asymmetry\_Factor-Coarse[675nm]`:`440-675\_Angstrom\_Exponent`"  [17] "`REff-F`:`440-675\_Angstrom\_Exponent`"  [18] "`Asymmetry\_Factor-Fine[675nm]`:`REff-F`" | [1] "`AOD[440nm]`"  [2] "`AOD[675nm]`"  [3] "`AOD\_Extinction-Fine[440nm]`"  [4] "`AOD\_Extinction-Fine[675nm]`"  [5] "`AOD\_Extinction-Fine[1020nm]`"  [6] "`AOD\_Extinction-Coarse[440nm]`"  [7] "`AOD\_Extinction-Coarse[675nm]`"  [8] "`AOD\_Extinction-Coarse[870nm]`"  [9] "`AOD\_Extinction-Coarse[1020nm]`"  [10] "`Asymmetry\_Factor-Fine[440nm]`"  [11] "`Asymmetry\_Factor-Coarse[675nm]`"  [12] "`Asymmetry\_Factor-Coarse[870nm]`"  [13] "`Asymmetry\_Factor-Coarse[1020nm]`"  [14] "`REff-F`"  [15] "`REff-C`"  [16] "`440-675\_Angstrom\_Exponent`"  [17] "`Asymmetry\_Factor-Coarse[675nm]`:`440-675\_Angstrom\_Exponent`"  [18] "`REff-F`:`440-675\_Angstrom\_Exponent`"  [19] "`Asymmetry\_Factor-Fine[675nm]`:`440-675\_Angstrom\_Exponent`"  [20] "`Asymmetry\_Factor-Fine[675nm]`:`REff-F`" |
| **Contributing variables without AOD**  **(out of a maximum of 20 items in the regression equation)** | [1] "`Angstrom\_Exponent\_440-870nm\_from\_Coincident\_Input\_AOD`"  [2] "`AOD\_Extinction-Fine[675nm]`"  [3] "`AOD\_Extinction-Fine[1020nm]`"  [4] "`AOD\_Extinction-Coarse[675nm]`"  [5] "`AOD\_Extinction-Coarse[1020nm]`"  [6] "`Asymmetry\_Factor-Fine[440nm]`"  [7] "`Asymmetry\_Factor-Fine[870nm]`"  [8] "`Asymmetry\_Factor-Fine[1020nm]`"  [9] "`Asymmetry\_Factor-Coarse[440nm]`"  [10] "`Asymmetry\_Factor-Coarse[675nm]`"  [11] "`REff-T`"  [12] "`REff-F`"  [13] "`REff-C`"  [14] "`440-675\_Angstrom\_Exponent`"  [15] "`Asymmetry\_Factor-Coarse[675nm]`:`440-675\_Angstrom\_Exponent`"  [16] "`Asymmetry\_Factor-Coarse[675nm]`:`REff-C`"  [17] "`REff-F`:`440-675\_Angstrom\_Exponent`"  [18] "`Asymmetry\_Factor-Fine[675nm]`:`440-675\_Angstrom\_Exponent`" | [1] "`AOD\_Extinction-Fine[440nm]`"  [2] "`AOD\_Extinction-Fine[675nm]`"  [3] "`AOD\_Extinction-Coarse[440nm]`"  [4] "`AOD\_Extinction-Coarse[1020nm]`"  [5] "`Asymmetry\_Factor-Fine[440nm]`"  [6] "`Asymmetry\_Factor-Coarse[440nm]`"  [7] "`Asymmetry\_Factor-Coarse[675nm]`"  [8] "`Asymmetry\_Factor-Coarse[870nm]`"  [9] "`Asymmetry\_Factor-Coarse[1020nm]`"  [10] "`REff-T`"  [11] "`REff-F`"  [12] "`REff-C`"  [13] "`440-675\_Angstrom\_Exponent`"  [14] "`REff-C`:`440-675\_Angstrom\_Exponent`"  [15] "`Asymmetry\_Factor-Coarse[675nm]`:`440-675\_Angstrom\_Exponent`"  [16] "`Asymmetry\_Factor-Coarse[675nm]`:`REff-C`"  [17] "`REff-F`:`440-675\_Angstrom\_Exponent`"  [18] "`Asymmetry\_Factor-Fine[675nm]`:`440-675\_Angstrom\_Exponent`" | [1] "`AOD\_Extinction-Fine[675nm]`"  [2] "`AOD\_Extinction-Fine[870nm]`"  [3] "`AOD\_Extinction-Fine[1020nm]`"  [4] "`AOD\_Extinction-Coarse[440nm]`"  [5] "`AOD\_Extinction-Coarse[675nm]`"  [6] "`Asymmetry\_Factor-Fine[1020nm]`"  [7] "`Asymmetry\_Factor-Coarse[675nm]`"  [8] "`Asymmetry\_Factor-Coarse[1020nm]`"  [9] "`REff-F`:`440-675\_Angstrom\_Exponent`"  [10] "`Asymmetry\_Factor-Fine[675nm]`:`440-675\_Angstrom\_Exponent`"  [11] "`Asymmetry\_Factor-Fine[675nm]`:`REff-F`" | [1] "`AOD\_Extinction-Fine[440nm]`"  [2] "`AOD\_Extinction-Fine[1020nm]`"  [3] "`AOD\_Extinction-Coarse[440nm]`"  [4] "`AOD\_Extinction-Coarse[675nm]`"  [5] "`Asymmetry\_Factor-Fine[440nm]`"  [6] "`Asymmetry\_Factor-Fine[675nm]`"  [7] "`Asymmetry\_Factor-Fine[1020nm]`"  [8] "`Asymmetry\_Factor-Coarse[675nm]`"  [9] "`Asymmetry\_Factor-Coarse[870nm]`"  [10] "`Asymmetry\_Factor-Coarse[1020nm]`"  [11] "`REff-F`"  [12] "`Asymmetry\_Factor-Coarse[675nm]`:`440-675\_Angstrom\_Exponent`"  [13] "`REff-F`:`440-675\_Angstrom\_Exponent`"  [14] "`Asymmetry\_Factor-Fine[675nm]`:`REff-F`" | [1] "`AOD\_Extinction-Fine[440nm]`"  [2] "`AOD\_Extinction-Fine[675nm]`"  [3] "`AOD\_Extinction-Fine[870nm]`"  [4] "`AOD\_Extinction-Fine[1020nm]`"  [5] "`AOD\_Extinction-Coarse[870nm]`"  [6] "`AOD\_Extinction-Coarse[1020nm]`"  [7] "`Asymmetry\_Factor-Fine[440nm]`"  [8] "`Asymmetry\_Factor-Fine[675nm]`"  [9] "`Asymmetry\_Factor-Fine[1020nm]`"  [10] "`Asymmetry\_Factor-Coarse[440nm]`"  [11] "`Asymmetry\_Factor-Coarse[870nm]`"  [12] "`Asymmetry\_Factor-Coarse[1020nm]`"  [13] "`REff-T`"  [14] "`REff-F`"  [15] "`440-675\_Angstrom\_Exponent`"  [16] "`REff-C`:`440-675\_Angstrom\_Exponent`"  [17] "`Asymmetry\_Factor-Coarse[675nm]`:`440-675\_Angstrom\_Exponent`"  [18] "`Asymmetry\_Factor-Coarse[675nm]`:`REff-C`"  [19] "`Asymmetry\_Factor-Fine[675nm]`:`440-675\_Angstrom\_Exponent`" |