Deployment of a PM2.5-capable Aerosol Chemical Speciation Monitor in Nanjing, China

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Experiment Overview

• Sampling Site
  • Jiangsu Environmental Monitoring Center Nanjing, China
    • Urban, rooftop (~18m above ground level, ~15m from nearest busy road, ~50m from restaurants, houses, etc.)
  • October 21 – November 19, 2015

• Instruments
  • PM1 ACSM
  • PM2.5 ACSM
  • PM1 BAM
  • PM2.5 BAM
  • PM2.5 MARGA
Results overview – ACSM and BAM Time Series

PM2.5 System

PM1 System

Date and Time (Local)


Mass Loading /µg m⁻³

Org
NO₃
SO₄
NH₄
Chl
BAM
PM1
PM2.5
Results overview – ACSM and BAM Correlation

PM2.5

Slope = 0.91

BAM / μg m\(^{-3}\)

PM1

Slope = 0.78

BAM / μg m\(^{-3}\)
Results Overview – ACSM and MARGA Time Series

[Graph depicting time series of mass loading for different compounds (NO₃, SO₄, NH₄) measured by ACSM and MARGA from 10/21/2015 to 11/10/2015.]
Case Study

PM2.5 System

PM1 System

Date and Time (Local)
Case Study – Organic Mass Spectra Comparison
Case Study – Organic Mass Spectra Comparison

Fractional Intensity

m/z 91
Summary

• Developed a PM2.5-capable ACSM and successfully deployed in Nanjing, China

• Good agreement between total PM2.5 and ACSM NR-PM2.5

• MARGA gives strong correlations with PM2.5 ACSM
  • Absolute agreement mostly good, NO3 data is the exception

• Mass spectra can inform understanding of chemistry between 1 and 2.5 microns

• Next step: Comparative factor analysis of PM1 and PM2.5 ACSM