KORUS-AQ campaign: Overview and Status
(1 May – 14 June 2016)

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Area with changing emissions over past decade

(Source: Lok Lamsal, GSFC)
Global pollution monitoring constellation: Tropospheric chemistry missions funded for launch 2017–2022

- **Sentinel-5P** (once per day)
- **TEMPO** (hourly)
- **Sentinel-4** (hourly)
- **GEMS** (hourly)

Courtesy Jhoon Kim, Andreas Richter

Policy-relevant science and environmental services enabled by common observations

- Improved emissions, at common confidence levels, over industrialized Northern Hemisphere
- Improved air quality forecasts and assimilation systems
- Improved assessment, e.g., observations to support United Nations Convention on Long Range Transboundary Air Pollution
Goals and Rationale

**Science:**
- Improve capability for satellite remote sensing of air quality
- Better understanding of the factors controlling air quality
- Test and improve model simulation of air quality

**International Collaboration**
Develop relationships that will enhance the global air quality satellite constellation including geostationary observations from TEMPO (NASA) and GEMS (KARI).

**Societal Impact**
A Rapid Science Synthesis Report led by investigators from NIER with support from the full Science Team will be presented to the Ministry of Environment.
KORUS-AQ combined assets from the Korean and U.S. atmospheric science communities and their supporting organizations (NIER, NASA, Universities, etc.) to implement an integrated observing system for improving our understanding of Air Quality

GOCI, OMI, MODIS, CALIPSO, IASI, etc.

Model evaluation and improvement, chemical process understanding, GEMS validation and observing strategies

NASA DC-8
LaRC King Air
Hanseo King Air

Operational Air Quality Forecasts, Regional and Global models of atmospheric composition

Air Quality Network, Research Sites, Research Vessels including in situ and remote sensing observations (lidar, Aeronet, Pandora)

KORUS-OC
NASA DC-8
LaRC King Air
Hanseo King Air

Baengyeong
Mt. Taehwa
Gwangju
Jeju

Seoul
Olympic Park
Daejeon
Ulsan

Geostationary Ocean Color Imager (GOCI)

Korean and US Air Quality Model Forecasts

RV Onnuri
RV Jang Mok
Selected sites in Korea's Air Quality monitoring network

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<tr>
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<th>Flight Days</th>
<th>Non Flight Days</th>
<th>Korean AQ Standard</th>
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<tr>
<td>24-hour average PM$_{2.5}$</td>
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<td>Max 1-hour average Ozone</td>
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<td>Max 8-hour average Ozone</td>
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Cooperative sampling of Power Plant and Seoul Emissions over the West Sea
Repetitive sampling by the DC-8 over research sites in Seoul and adjacent rural areas
Special access by the Hanseo King Air to map emissions over major portions of Seoul north of the Han River
Repetitive sampling by the NASA King Air to map emissions over the Seoul Metropolitan Area and adjacent rural areas
GeoTASO Quick-look differential slant column NO$_2$
2016/06/09, 8:00-10:00 AM local time

Preliminary data, courtesy Scott Janz, NASA GSFC
GeoTASO Quick-look differential slant column NO$_2$
2016/06/09, 10:00 AM-12:00 PM local time

Preliminary data, courtesy Scott Janz, NASA GSFC
GeoTASO Quick-look differential slant column NO₂
2016/06/09, 2:00-4:00 PM local time

Preliminary data, courtesy Scott Janz, NASA GSFC
GeoTASO Quick-look differential slant column NO$_2$

2016/06/09, 4:00-6:00 PM local time

Preliminary data, courtesy Scott Janz, NASA GSFC
A science team meeting is planned for Spring 2017 and final data are expected by July 2017

Also find blogs, photos, videos, and more by searching “NASA Earth Expeditions KORUS-AQ”
THANK YOU
Backup Slides
3rd ACAM Workshop
Guangzhou, China
5-9 June 2017

2nd ACAM Training School
Guangzhou, China
10-12 June 2017

https://www2.acom.ucar.edu/acam