

## **Developing Future Air Quality Observing Strategies: Contributions from Integrated Field Studies**

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Improving the remote sensing of air quality was a central goal of the Korea-United States Air Quality Field Study (KORUS-AQ) conducted in May-June of 2016. Building on ideas first explored during of a series of field studies conducted over the United States by a project called DISCOVER-AQ (Deriving Information on Surface conditions from COlumn and VERtically resolved observations relevant to Air Quality), KORUS-AQ implemented an integrated observing system that included multiple aircraft and ground sites instrumented to provide multi-perspective observations (in situ and remote sensing) of the distribution of gaseous and particulate pollution in the lower atmosphere across the Korean peninsula with a focus on the Seoul Metropolitan Area. The KORUS-AQ observations are actively being used to promote improvements in remote sensing in the following ways: Characterizing vertical structure in the atmosphere and its diurnal patterns to develop improved a priori information for satellite retrievals; Examining horizontal variability to assess the spatial scales needed to resolve emissions and photochemistry; Determining correlative relationships between remotely sensed and in situ observations; Assessing the value of ground-based remote sensing to provide information on impact of boundary layer dynamics and mixing on air pollution. Current progress on analysis of these datasets and their relevance to future geostationary satellite observations as well as augmentation of air quality monitoring networks with ground-based remote sensing will be discussed. Current progress will also be shared regarding a proposed international field study called Hemispheric Airborne Measurements of Air Quality (HAMAQ) involving researchers from across Asia, North America, and Europe to assess integrated air quality observations in the 2020-2023 timeframe.

**Keywords:** air quality, integrated observations, remote sensing