## Abstract

Title:

Air Quality Monitoring and Analysis in Populous areas in China (AQMAP)

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Using satellite observations of trace gases and aerosols, this project studies the air pollution in the most populous regions in China: the North China Plain (NCP) and along the Yangtze River. With a total population of about 700 million, these regions are amongst the most densely populated regions in the world. Human activities, traffic, transportation and heavy industry in these areas result in high anthropogenic emissions with a variety of adverse effects. Monitoring and analysis of air quality is essential to evaluate different factors (emissions and emission reduction policy, meteorological factors, atmospheric chemistry and physics) contributing to the pollutant concentrations. We have focused on the important components of air quality (AQ). The results of the work from last year will be presented.

We have derived the NOx and NH3 emissions over the populous areas in China. The effects of emission reduction to improve AQ and competing meteorological processes will be evaluated.

The evaluation of proxies to detect the occurrence of new particle formation using groundbased remote sensing and in situ data was successfully completed using data from the Beijing-RADI site during the winter of 2022. The study on the evolution of AOD over China and the competition between anthropogenic and meteorological influences will use satellite data in combination with model simulations. FY-4A data are used for the study of cloud detection and aerosol retrieval. We also examine nocturnal ozone surge events in Wuhan between 2016 and 2023 and employs self-organizing maps (SOM) to analyze the prevailing synoptic weather patterns associated with these events.