

## Proposal of Geostationary Observation of Atmospheric chemistry and Lightning (GOAL)

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High spatial and temporal observations, which require geostationary observations, are now eagerly required for earth sciences. This paper describes proposal of the Geostationary Observation of Atmospheric chemistry and Lightning (GOAL). Largescale air pollution affects human heath and crop production. The characteristics of large-scale air pollution require global dense observation (10km and 1 hr). Lightning is also highly spatial and temporal phenomena, and its observation is an important subject both in climate and meteorological studies. Observations of large scale air pollution and lightning from space have been demonstrated, but they gave once/twice a day observations. Geostationary observation of air pollution and lightning are under development for the operational geostationary satellites by NOAA and EUMETSAT. We propose GOAL satellite to observe the air pollution and lightning in Asian region. GOAL.

Tropospheric O<sub>3</sub> has been increasing in 1.6%/year since around 1900. It is now about 60 ppb and will exceed 100 ppb around 2025, which will impact on both human health and vegetations (10-40% crop yields). Geostationary observation of NOx and CO will help to quantitative understanding of surface O3 formation, which is necessary to prepare global strategy for controlling surface O3 increase. UV/Visible grating spectrograph (270-450nm), CO gas correlation sensor (2.3 $\mu$ m) and UV/Visible Imager with 10 km resolution will be proposed for this mission. Geo stationary lightning observation will improve our understandings of meteorology, climate and chemistry (NOx formation). Geostationary lightning observations are under development by NOAA and EUMETSAT, but there have been no such a plan for Asian region. A 777.4 nm imager similar to GOES-R/LMS are proposed for the GOAL satellite.

Keywords: Geostationary obseration, UV/Visible, imaging spectrograph, surface O<sub>3</sub>, NOx, CO, lightning.