

Earth's health diagnosis - Imaging spectrometer of SLCP for early verification of global warming countermeasure effect, and understanding of status of air pollution -

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We propose a satellite constellation observation plan that understanding of inventory of short-lived climate pollutants (SLCP*) emitted by human activities. SLCP is related to both air pollution and climate change. As the reduction effect of SLCP is obtained in the short term compared with CO₂, ministerial-level international efforts began in 2012 as a new method of countermeasures against global warming (CCAC). In addition, the number of deaths due to air pollution is around 3.7 million people worldwide (WHO Report 2012), which is about three times the number of traffic fatalities. Especially, the rate of early death in Japan is at the highest level in OECD countries and the situation is serious. Also, the impact on agricultural crops can not be ignored. SLCP has local sources of emissions, and observation with a spatial resolution of 1 km class is necessary for grasping actual conditions, but it has not existed so far due to technical difficulties. The proposed SLCP imaging spectrometer (UV / VIS / SWIR) is installed in the low orbit satellite asynchronously realizing the world's first high horizontal resolution (target: horizontal resolution 1 to 2 km), day change observation. We propose detection of SLCP substances in the vicinity of the ground (especially oxidants affecting health damage) by MIR + MW spectroscopic observation synergy as an optional function. From the spatial resolution and observation local time (LT), this sensor has the function as "standard machine" for air pollution satellite observation around the world, and the existence of this machine enables constellation connecting world satellites. This will integrate satellite data around the world, obtain the highest standards of scientific knowledge and encourage evidence-based measures.

Keywords: Air pollution, Satellite, Imaging spectrometer