

## A New Satellite System for Observing Global Weather and Water from Geostationary Orbit

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We propose a future earth satellite system for observing global weather and water, namely, a geostationary satellite equipped with i) an infrared hyperspectral sounder, ii) a microwave sounder, iii) a microwave imager, and iv) a visible-to-infrared imaging spectroradiometer. The goal of this satellite is to monitor and reveal the mechanism of continuous weather transitions from clear sky to cloud and from cloud to precipitation. Since the satellite is equipped with passive sensors covering the visible to microwave regions, it can observe atmospheric aerosols, clouds, water vapor, and temperature. Primary observation targets are temperature profile, water vapor profile, precipitable water, liquid water path of clouds, optical thickness of aerosols and clouds, cloud top temperature, and precipitation. One of the features of this system is that it allows very high-frequency full-disk observation. The target temporal observation interval is 10 min, so we name the proposed satellite Weather and Water Watch, Delta Time 10 (WWW-DT10). There remain some technical challenges, such as developing a very large microwave antenna and a full-disk scanning mechanism for microwave sensors. This system will contribute to monitoring natural disasters such as torrential rains, and also contribute to mitigating uncertainties in global model simulations by assimilating its data into the models. We will describe this system in this presentation.

Keywords: Weather, Water, Geostationary Orbit, Satellite Observation