
[EE] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-CG Complex & General

[A-CG36]Satellite Earth Environment Observation

convener:Riko Oki(Japan Aerospace Exploration Agency), Yoshiaki HONDA(Center for Environmental Remote Sensing, Chiba University), Yukari Takayabu(東京大学 大気海洋研究所, 共同), Tsuneo Matsunaga(Center for Global Environmental Research and Satellite Observation Center, National Institute for Environmental Studies)

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In recent years, we cannot avoid facing issues on global environmental changes that occur in various spatiotemporal scales. The earth environmental observation data by satellites became the necessary basic data to tackle and solve those issues. Due to the recent advancement in the observation sensor technique and the data processing technique, the satellite observation has been showing rapid progress, and the time is changing from examining the accuracy of the observation sensor data to the advancement of the data application, leading to broaden potential users. In these days application became synergetic, so we comprehensively pick

up this topic in the Atmospheric and Hydrospheric Sciences Session of this Union Meeting that enables to comprise the atmospheric, oceanic and land sciences; by combining the intelligence and the knowledge of the party, we propose a session that aims to prompt further studies towards the issues on earth environmental change, the advancement in the data application and future plans of Earth Observation missions.

[ACG36-P29]Improved satellite estimation of surface humidity using vertical water vapor profile information

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An accurate estimation of the air-sea fluxes is crucial for studies of the global climate system. Estimating surface flux using satellite remote sensing techniques is one possible answer to this challenge. Surface air specific humidity is one of essential climate variables and is also a key variable in the estimation of air-sea latent heat flux and evaporation from the ocean surface. Current remote sensing techniques are problematic and a major source of errors for flux and evaporation. Here, we propose a new method to estimate surface humidity using satellite microwave radiometer instruments (SSM/I, SSMIS, AMSR-E, TMI, and AMSR2), based on a new finding about the relationship between multi-channel brightness temperatures measured by satellite microwave radiometers, surface humidity, and vertical moisture structure. Satellite estimations using the new method were compared with in situ observations to evaluate this method (Fig.1), confirming that it could significantly improve satellite estimations with high impact on satellite estimation of latent heat flux and evaporation. Finally, multi-satellite global air-sea latent heat flux was calculated over 1988-2015 as a part of the third-generation data set of Japanese Ocean Flux Data Set with Use of Remote-Sensing Observations (J-OFURO3). A general quality and improved features of the data set were investigated. J-OFURO3 data are of outstanding quality, facilitating a clearer understanding of more fine-scale ocean-atmosphere features and more long-term flux variation based on multiple satellite observations.