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On the data handling for the international ground-based network (SKYNET) observing aerosols, clouds, and radiations

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SKYNET is an observation network dedicated for aerosol-cloud-radiation interaction researches. It was initiated under the WCRP/GAME project and expanded focusing on East Asia as the ADEOS/GLI validation activity. The primary objectives of SKYNET are 1) to quantitatively evaluate long-term variations of aerosols, clouds, and atmospheric radiation and 2) to understand their effects on climate through aerosol-cloud-radiation interaction. In addition, the validation for satellite observations (e.g., GOSAT, GOSAT-2, GCOM-C, EarthCARE, and Himawari-8) as well as climate model simulations and data assimilations are also within the scope of the SKYNET activity. To accomplish these objectives, SKYNET observes optical and microphysical properties of aerosols and clouds and atmospheric radiation in worldwide under close collaboration among national agencies, institutes, and universities. All sites of SKYNET are equipped with one or more sky radiometers as the main instrument. To strengthen the ability of the SKYNET, simultaneous measurements with other instruments such as pyranometer, pyrgeometer, microwave radiometer, absorption meter, cloud camera, lidar, and MAX-DOAS are also conducted for some selected sites. These various data measured at each site are collected by a local computer and then transferred via the Internet to Center for Environmental Remote Sensing (CEReS) of Chiba University and National Institute for Environmental Studies (NIES) in real time and processed automatically. In addition, since the data are stored in the local computer first, this system works as the open system that data can be processed and analyzed by the observer as well. As a result, a solid collaborative framework has been formed to improve analysis softwares and enhance data analysis by the community. Considering the potential expansion of SKYNET, for instance, for upcoming satellite validation activities, we desire improved instrument and data handling systems to better use limited human and pecuniary resources. Such discussions are made in this talk, along with some new findings obtained from recent SKYNET activities.

Keywords: SKYNET, ground-based observation, network, aerosol, cloud, radiation