

construction of geostationary satellites database for formation of a virtual laboratory for diagnosing earth's climate

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In order to diagnose the earth's climate system facing global warming, a virtual laboratory (VL) was established in 2007 as a joint program conducted by four research centers of (1) Center for Climate System Research (CCSR), the University of Tokyo, (2) Hydrospheric Atmospheric Research Center (HyARC), Nagoya University, (3) Center for Atmospheric and Oceanic Studies (CAOS), Graduate School of Science, Tohoku University, and (4) Center for Environmental Remote Sensing (CEReS), Chiba University. This program will continue for seven years. Each participating institute contributes to the program by exploiting their own strengths, for example, archiving datasets of greenhouse gases, aerosols, microphysical parameters of clouds, vegetation parameters, and the structure of cloud and precipitation systems. These data are crucial for validating and evaluating General Circulation Models (GCMs) and regional cloud-resolving model simulations. Furthermore, we aim to train young scientists through this research program. While a short training course is held every year hosted by one of our participating institutes in turn, we exchange our staff and young scientists to give seminars.

The VL members at CEReS play the role of archiving, processing and publishing geostationary meteorological satellites (GEOs) datasets. GEOs observation by each national (or international) meteorological agencies, such as JMA (GMS series, MTSAT), CMA (FY2 series), EUMETSAT (Meteosat and MSG series) and NOAA (GOES-W, -E series) from visible and infrared wavelength is one of the most powerful tools to diagnose the Earth climate system with high-resolution both in space and time. Currently CEReS has more than a ten year archiving (at least 1998-2008) with re-sampling into grided data format (geo-coordinated files). All of grided dataset except EUMETSAT series GEOs due to data policy can accessed through the Internet (by ftp protocol). CEReS also develops with related national and international frameworks, a merging technique among the geostationary satellites with highly calibrated GEOs detected signals and a retrieval algorithm to retrieve the earth's radiation budget and physical parameters such as cloud optical thickness and cloud liquid water. In this way, this dataset would greatly contribute to study on precipitation/cloud characteristics and validations of numerical models.

Keywords: virtual laboratory, diagnosing the earth climate, geostationary meteorological satellites