

From Satellite Data to Informatics –Towards The Development of Satellite-based Real-Time Informatics in Community Satellite Processing Package (CSPP)

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In cooperation with the United States National Oceanic and Atmospheric Administration (NOAA) and National Aeronautic and Space Administration (NASA), Cooperative Institute for Meteorological Satellite Studies (CIMSS) of Space Science and Engineering Center (SSEC) is continuing to develop NASA-supported International MODIS/AIRS Processing Package (IMAPP) and NOAA-funded Community Satellite Processing Package (CSPP). These community software packages are to provide both official and users developed algorithms and processing codes for the optimal and broad use of international polar orbiter satellite and geostationary satellite data collected from NOAA/NASA S-NPP, GOES-R, EUMETSAT METOP series, and Japanese Meteorological Administration (JMA) Advanced Himawari Imager (AHI).

This paper starts with the overview of ~16 years (2000-2016) of success of IMAPP and CSPP as a pathway to the development of a freely available software package to transform MODIS, AIRS, AMSU, VIIRS, CrIS, and ATMS Raw Data Records (RDRs) (i.e. Level 0) to Sensor Data Records (SDRs) (i.e. Level 1), SDRs to Environmental Data Records (EDRs) (i.e. Level 2) and Information Data Record (IDRs) in support of Terra, Aqua, Suomi NPP and subsequently the JPSS and GOES missions under the CSPP framework.

Moreover, the current innovations in the development of Information Data Record (IDR) from single or multiple EDR and other ancillary and auxiliary data, to become the foundation of CSPP informatics. Examples of real-time applications using EDRs and IDRs in nowcasting and nearcasting of severe weather, aviation operation and air quality monitoring are to be highlighted. Summary is given to conclude this community effort in facilitating the user-friendly end-to-end calibration, navigation, product generation and information integration that are suitable and freely available to all users of meteorological and environmental satellites.

Keywords: Community satellite processing package, Sensor Data Record; Environmental Data Record; Information Data Record, Nowcasting; Nearcasting