

## Nowcast and Short-Term Forecast of Solar Radiation and Photovoltaic Power using 3rd generation Geostationary Satellites -AMATERASS GIS PV power monitoring and estimation of energy demand based on human activity-

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Earth getting warm by incoming solar radiation and emitting the thermal energy to space by outgoing terrestrial radiation. Clouds can cool the Earth by reflecting solar radiation but also maintain warmth by absorbing and emitting terrestrial radiation. Similarly aerosols have an effect on radiation budget by absorption and scattering of Solar radiation. Therefore it is important to estimate the earth's radiation budget accurately based on observation for understanding of climate. In recent years, how to introduce the photovoltaic power generation/renewable energy to electric power grid has been discussed. The surface downwelling solar energy has instantaneous change by weather phenomena. It needs accurate estimation technique for Nowcast and Short-term forecast of solar radiation. In this study, we developed the high speed and accurate algorithm for shortwave (SW) radiation budget and it's applied to geostationary satellite for rapid analysis. This technique enabled highly accurate monitoring of solar radiation and photovoltaic (PV) power generation. We update the algorithm by new radiative transfer solver by Neural Network Learning Algorithm plus (LA+) accelerate advanced remote sensing technique by Active learning and NNN. This presentation provides introduction of solar radiation estimation algorithm, user interface "AMATERASS GIS", and approach of estimation of energy demand based on human activity. (This research was supported in part by CREST/EMS/JST)

Keywords: Satellite remote sensing, Solar radiation, Renewable energy, Photovoltaic power

