

A Report of World-Wide, Regional, and Domestic Activities of Space Weather Operations and Researches

MURATA, Ken T.^{1*}, WATARI, Shinichi¹, NAGATSUMA, Tsutomu¹

¹NICT

Space environment, where satellites and international space stations (ISS) are located, dynamically change due to the effect of solar activities. Disturbances in space occasionally cause satellite malfunctions, tele-communication problems, and error of navigations. The role of space weather forecast is to monitor the current conditions and to predict the future conditions of space environment. As our daily life tend to depend on a variety of electric and electronic devices and systems, the role of the space weather would be inevitable.

NICT is a part of ISES (International Space Environment Service: 14 nations have participated) space weather forecast centers (regional warning centers: RWC). We have been routinely carrying out daily space weather forecast services and provide information on the forecasts of solar flare, geomagnetic disturbances, solar proton event, and condition of radio-wave propagation to public.

As known well, the solar activity changes periodically with 11 years. Now we are at the developing phase of the cycle 24, and the peak of the phase will be around 2013 or 2014. Practical space weather forecast is expected, but unfortunately, our forecasting is not yet perfect. For example, our solar-flare prediction score and geomagnetic disturbance prediction are between 50% and 90% respectively.

For more accurate and practical space weather forecasting, international collaborations would play an important role. During these few years, new international activities have started: One is in UN (United Nations) and the other is in WMO (World Meteorological Organization). Regional collaboration is also necessary, especially for the ionospheric researches and observations in space weather operations. NICT and other 13 organization have kicked off a new alliance for space weather: the Asia-Oceania Space Weather Alliance (AOSWA).

In the present talk, we first review what the space weather is, with focusing on the effect of disturbances in space to our social systems, from spacecraft to GPS navigation systems. We next introduce recent world-wide, regional and domestic activities of space weather.

Keywords: Space Weather, AOSWA, ISES, UN, WMO