

Report for the mid-point evaluation meeting on October 19 2018

The inner magnetosphere is a major region of the geospace full of high energy particles and waves that cause anomalies on the spacecrafts and the ionosphere, but these regions have not been fully studied. PWING timely started and is now clarifying the physical processes in the inner magnetosphere and ionosphere with ground-based and satellite observations and modeling. Most of the ground-based observation facilities are conventional, but they are well organized to be a new network so that the facilities cover all local times at subauroral latitudes conjugate to the inner magnetosphere.

Interesting observations have been presented at the meeting. The equatorward detachment of the SAR arc is impressive, although the explanation with injection of energetic electrons seems preliminary. The good correlations between the decrease in ERG/XEP and EMIC activities and between the chorus at Athabasca and RBSP are achievements of the coordinated ground-based and satellite observations. The coordinated observations also revealed the close relationship between the PANSY and IRIO observations of the polar mesospheric winter echo and the different behavior of the midlatitude trough from the plasmopause; the trough moves poleward during the storm recovery phase, while the plasmopause remains at the same location. The global simulation reproduced the toroidal mode in the inner magnetosphere, which would help understand how the toroidal mode observed by Arase is excited. Likewise, the reproduced geomagnetic perturbations would give an idea about the source currents for the recorded magnetic perturbations with different features at different latitude and local times. The electric field measurement by Arase will be important to estimate the input of electromagnetic energy into the inner magnetosphere, which would help improve the electric field model used in the calculations of the energetic electrons.

The PWING project has successfully proved advantages of coordination of ground-based and satellite observations and modeling, which provides us with new/different aspects of the space weather phenomena. I hope PWING continues to produce profitable results during the latter half period of the project.

Takashi Kikuchi  
Professor Emeritus  
Nagoya University