Program of the Antarctic Syowa MST/IS radar (PANSY)

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Related International Research Project
SPARC(Stratospheric Processes And their Role in Climate)/WCRP(World Climate Research Programme)
SCOSTEP(Scientific Committee on Solar-Terrestrial Physics)/ICSU
Recommendation from SPARC and SCOSTEP, and resolution from IUGG, URSI, and SCAR have already been obtained for PANSY.

Description of the Program
PANSY is a plan to introduce the first MST (Mesosphere-Stratosphere-Troposphere) /IS (Incoherent Scatter) radar, which is a VHF monostatic pulse Doppler radar, in the Antarctic to Syowa Station (39E, 69S) as an important station observing the earth's environment with the aim to catch the climate change signals that the Antarctic atmosphere shows. This radar consists of about 1000 crossed Yagi antennas having a power of 500kW which allows us
to observe the Antarctic atmosphere with fine resolution and good accuracy in a wide height range of 1-500 km. Main targets of this project are sciences of 1. tropospheric circulation induced by Antarctic katabatic winds in the southern hemisphere, 2. effects on the earth climates by small-scale atmospheric phenomena such as gravity waves, tides, and vortical disturbances, 3. clouds appearing only in the polar region. i.e. polar stratospheric clouds that accelerate stratospheric ozone destruction, and polar mesospheric clouds that are observed only after the end of 19th century and hence regarded as canary of the earth climate, 4. polar ionospheric disturbances such as aurora with different view points from conventional observation. The comparison of characteristics of atmospheric phenomena in the low and middle latitude region and ionospheric phenomena in arctic region is another important topic of this project. The interaction of the neutral atmosphere with the ionosphere and magnetosphere as well as the global-scale atmospheric circulation including low and middle latitude regions are also targets of PANSY. The observation data with high resolution obtained by the PANSY radar are also valuable for the certification of the reality of phenomena simulated by high-resolution numerical models. The radar construction would start in 2007 and the observation is supposed to continue for 11 years (one cycle of solar activity).