100

SOLAR-TERRESTRIAL AND AERONOMY RESEARCH IN ANTARCTICA… AND IN THE ARCTIC: HOW POLAR REGIONS INTERCONNECT?

V. O. Papitashvili

SPRL, University of Michigan, Ann Arbor, Michigan, United States

Geospace provides the material link between the Sun and Earth through the solar wind interaction with the Earth's magnetic field. The interaction processes form a huge cavity (called Earth's magnetosphere) around the planet with a boundary (magnetopause) that converges entirely into the polar regions. Bursts of solar plasma (coronal mass ejections) pose potential hazards to space-borne and ground-based technological systems on which humans are now increasingly dependent. A multitude of ground-based instruments and satellite missions allow us to study near-Earth space (geospace) globally and instantaneously. However, the huge volume of geospace makes any three-dimensional data coverage sparse; therefore, only experimental solar-terrestrial and aeronomy observations in the Arctic and Antarctic can provide long-term, comprehensive series of data to understand near-Earth space weather (as short-term events like magnetic storms) and geospace climate changes (as trends in the electromagnetic and plasma environment over solar activity cycles). The SCAR Scientific Programme ICESTAR aims on building a unified framework that can specify and predict the global state and near-term dynamics of geospace. The polar regions are connected simultaneously to the dayside magnetopause, magnetospheric flanks, and to the magnetotail via geomagnetic field lines and intra-magnetospheric plasma convection. Therefore, if anything changes in the magnetosphere over the Arctic, we can see it over the Antarctic as well, and vice versa. This presentation will demonstrate why the solar-terrestrial and aeronomy observations from the polar vantage points are important for understanding the conjugacy of geospace phenomena between the poles and with various magnetospheric domains. URL: http://www.siena.edu/physics/ICESTAR/