

Introduction of ROSMIC project in SCOSTEP/VarSITI program

OTSUKA, Yuichi^{1*} ; NAKAMURA, Takuji² ; TAKAHASHI, Yukihiro³ ; LUEBKEN, Franz-josef⁴ ; WARD, William⁵ ; SEPPALA, Annika⁶

¹Nagoya University, ²National Institute of Polar Research, ³Hokkaido University, ⁴Leibniz Institute of Atmospheric Physics, Germany, ⁵University of New Brunswick, Canada, ⁶Finnish Meteorological Institute, Finland

ROSMIC (Role Of the Sun and the Middle atmosphere/thermosphere/ionosphere In Climate, co-leaders: F.-J. Luebken, A. Seppala, W. Ward) is one of the four projects in VarSITI started in 2014 as a five year project. The goal of the project is to understand the impact of the Sun on the terrestrial middle atmosphere/lower thermosphere /ionosphere (MALTI) and Earth's climate and its importance relative to anthropogenic forcing over various time scales from minutes to centuries. ROSMIC project consists of four sub-projects: 1) Coupling through solar variability (radiative, electrodynamics, ionospheric and photochemical effects), 2) Coupling by dynamics, 3) Trends in Mesosphere and Lower Thermosphere, 4) Trends and solar cycle effects in the thermosphere (incl. technological aspects). The project will be conducted under close collaborations between observations and modelings. Observations include both usage of existing data records and new measurements from a wide range of ground based (lidars, radars, mappers), in-situ (rockets, balloons, aircraft), and satellite (e.g., AIM, TIMED) instruments. Dedicated models are used and developed for a better understanding of specific processes (e.g. gravity wave breaking, ice formation). Global scale models will be modified and applied from the ocean to the thermosphere. Through the five year projects, we expect better understanding of the impact of solar activity on the entire atmosphere, relative to anthropogenic forcing and natural long term variability. In the paper, we will introduce outline of ROSMIC project and discuss how Japanese activities contribute to the ROSMIC project.

Keywords: Sun, middle atmosphere, thermosphere, ionosphere, climate