



## Ground-Based GNSS Meteorology and Reflectometry Studies on Horseshoe Island during the 4th National Antarctic Science Expedition of Turkey: Installation and configuration of sea/ice level and water vapor monitoring stations.

Mahmut Oguz Selbesoglu<sup>1</sup>, Hasan Hakan Yavasoglu<sup>2</sup>, **Mustafa Fahri Karabulut**<sup>3</sup>, V. Engin Gulal<sup>4</sup>, Himmet Karaman<sup>1</sup>, Mustafa E. Kamasak<sup>1</sup>, Ozgun Oktar<sup>2</sup>, and Burcu Ozsoy<sup>2</sup>

<sup>1</sup>Istanbul Technical University, Istanbul, Turkey (selbesoglu@itu.edu.tr, karamanhi@itu.edu.tr, kamasak@itu.edu.tr)

<sup>2</sup>Tubitak Marmara Research Center Polar Research Institute, Kocaeli, Turkey (hakan.yavasoglu@tubitak.gov.tr, ozgun.oktar@tubitak.gov.tr, burcu.ozsoy@tubitak.gov.tr)

<sup>3</sup>Yildiz Technical University, Istanbul, Turkey (mfahri@yildiz.edu.tr)

<sup>4</sup>Atlas University, Istanbul, Turkey (engin.gulal@atlas.edu.tr)

The radiation balance of our planet affect climate system that showing signs of breaking down due to the rising temperatures, melting of ice and water flows to the oceans from glaciers. In the last decade, GNSS Meteorology and Reflectometry methods are increasingly used for global climate change studies that provides important parameters such as water vapor in the troposphere and ice/sea level measured based on reflected signals. The main purpose of the study is retrieving meteorological and physical parameters of the Earth's surface in the Antarctica to contribute monitoring climate change. For this purpose, dual antenna and single antenna GNSS stations were specially designed within the scope of TUBITAK research project 118Y322 to produce output by combining an ultrasonic sensor to detect real-time ice/sea level. These two GNSS stations including meteorological station were installed on Horseshoe Island during 4th National Antarctic Science Expedition of Turkey (TAE-4). It is believed that these stations will contribute to monitor global climate change by providing important information about troposphere and physical characteristics of Earth surface. In this study, the processes and objectives from the design works of the stations to their installation in Antarctica are explained.