Geophysical Research Abstracts
Vol. 17, EGU2015-14455, 2015
EGU General Assembly 2015

Recent Airborne Radar Depth Sounding of Recovery Glacier

Jilu Li (1), Sivaprasad Gogineni (1), Stephen Yan (1), Ali Mahmood (1), Abhishek Awasthi (2), and Fernando Rodriguez-Morales (1)

(1) Center for Remote Sensing of Ice Sheets, University of Kansas, Lawrence, United States (pgogineni@ku.edu), (2) Indian Institute of Technology Kanpur, Kanpur, India (abhiawas@iitk.ac.in)

Recovery Glacier in East Antarctica drains a large volume of ice into Filchner Ice Shelf towards Weddell Sea. The existence of several subglacial lakes beneath the channel has been speculated based on satellite observations of elevation changes on the ice surface. Because of its important role in East Antarctic ice mass balance and its unique function in the ice-flow dynamics of Recovery Ice Stream, two NASA Operation IceBridge (OIB) missions have been flown over Recovery Glacier, the first in October 2012 and the second in October 2014. The airborne radar depth sounder (RDS) data collected during these two missions by the Center for Remote Sensing of Ice Sheets (CReSIS) Multi-channel Coherent Radar Depth Sounder/Imager (MCoRDS/I) have revealed both the presence of a very deep channel and its complex shape, data that contribute to the study of the ice-flow dynamics of the glacier and estimations of its mass balance.

In this paper, we will report the results of measurements collected during the 2014 Antarctica DC-8 mission for OIB. Data were collected using an improved version of the CReSIS MCoRDS/I. We increased transmit power to each element of the transmit-array from about 200 W to 1000 W and increased the chirp bandwidth to 50 MHz, compared to 9.5 MHz used in earlier OIB missions. These improvements have led to a more complete mapping of the deepest part of the channel, which is more than 3.7 km deep, and fine-resolution mapping of internal layers. Our preliminary analysis of radar echoes does not indicate the presence of water or a wet surface in subglacier lakes. This paper presents an overview of the radar system, results from our recent measurements, and analysis of these results.