

HDS025-08

Room:103

Time:May 22 11:30-11:45

Geophysical Exploration on Moraine Dam in Bhutan Himalaya

Kengo Ohashi^{1*}, Hirenori Demura¹, Tsering PENJORE²

¹Earth System Science Co.,Ltd, ²Department of Geology and Mines, Bhutan

There are many glacial lakes formed by the retreat of the glacier in Bhutan Himalaya. In some of them, satellite image analysis indicates the danger of glacier lake outburst floods (GLOF). Assessment of damage by GLOF in these lakes is very important for disaster prevention. And, the internal information of the moraine dam, like the existence of dead ice, is essential for disaster prevention. In this survey, to estimate the internal structure of the moraine by using the resistivity and the S-wave velocity obtained by geophysical exploration and to examine the validity of these methods.

The resistivity of the ice body and debris was measured in a D type glacier as a prospect survey. These results are very important for estimating the internal information. As a result, it was recognized that there was no ice body inside the moraine when the resistivity value was less than 20k ohm-m. 2Delectric sounding was carried out on two moraines. (ZanamC glacier lake and Metatsota glacier lake). Consequently, it was presumed that an ice body did not exist in the moraine, because the measured resistivity value was less than 20k ohm-m. Moreover, the Microtremor array results on the Metatsota glacial lake became similar to the 2D electrical sounding results. For this reason, geophones were able to be deployed extensively in a wide plain. On the other hand, an excellent result was not obtained in the ZanamC glacial lake. For this reason, geophones were able to be deployed only locally in a rough terrain. The development of the method and analysis is a problem for future examination for terrain conditions like ZanamC Glacier Lake.

Keywords: glacier lake outburst floods (GLOF), moraine dam, 2Delectric sounding, Microtremor array, Dead ice