

UPPER CRUSTAL STRUCTURE IN THE VICINITY OF SYOWA
STATION, EAST ANTARCTICA, AS REVEALED
BY EXPLOSION SEISMIC EXPERIMENTS

Kiyoshi Ito,

*Regional Observation Center for Earthquake Prediction, Faculty of Science,
Kyoto University, 944, Nasahara, Takatsuki 569*

Akira IKAMI,

*Regional Center for Earthquake Prediction Observation, School of Science,
Nagoya University, Furo-cho, Chikusa-ku, Nagoya 464*

Kazuo SHIBUYA and Katsutada KAMINUMA

National Institute of Polar Research, 9-10, Kaga 1-chome, Itabashi-ku, Tokyo 173

Abstract: Two explosion seismic experiments were conducted for the investigation on the velocity structure of the snow-free area of East Antarctica by the 21st Japanese Antarctic Research Expedition (JARE-21). In one of the experiments made along a line of 5.2 km, two explosions of 100 and 80 kg in charge amount were fired in the sea and eleven stations were established at about 0.5 km intervals on the rocks outcropped in East and West Ongul Islands. The other smaller charge experiment was made in East Ongul Island to reveal shallower structure of snow-free area. Five shots were fired and generated seismic waves were observed at eight stations along two lines of 0.7 and 0.9 km long. In both of the experiments direct waves were clearly recorded at all the stations as the first arrivals. The mean apparent velocity and the mean interval velocity (distance from shot is divided by travel time) of the waves are 6.19 ± 0.11 and 5.74 ± 0.88 km/s, respectively. The obtained velocity of the snow-free area in the vicinity of the Ongul Islands is nearly the same as the velocities under the ice sheet of all areas in East Antarctica previously obtained by the research expeditions of the United States, USSR and Japan. A velocity increase with depth was not obtained in the area. The sedimentary layer with low velocity is very thin or does not exist, as the intercept time of the 6 km/s-layer is nearly zero.

Clear later arrival phases with large amplitude were also detected at all the stations of 0.1 to 5.2 km from the shot point. The mean apparent velocity and the mean interval velocity are 2.84 ± 0.03 and 2.94 ± 0.37 km/s, respectively. As the velocity is about a half of *P*-wave and smaller than that of *S*-wave derived from the usual V_p/V_s , for example 1.73, the phase seems to be Rayleigh wave.

(Received April 4, 1983)