

東南極、リュツォ・ホルム岩体、東オングル島での浅層反射法地震探査

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Shallow reflection surveys of the East Ongul Island, the Lützow-Holm Complex, East Antarctica

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The shallow reflection surveys were carried out in 2010 austral summers in the East Ongul Island, of the Lützow-Holm Complex (LHC), East Antarctica. The LHC is defined by geologically as one of the Pan-African terrains of Eastern Dronning Maud Land. The multi-channel reflection surveys targeted to achieve the image of laminated layering of metamorphic rocks of the surface (down to few hundreds of meters) of the crystalline crust. Surveys were conducted in austral summer in total length of profile of 500 m along the main traffic load across the East Ongul Island. The 24 channel acquisition system was utilized by dense geophones with interval of 12.5m. The AD sampling interval was applied for 0.5 ms in order to detect the detailed structure of laminated layers for the basement metamorphic rocks (with P-wave velocity of 6 km/s). Seismic sources in 25 m interval were utilized with combining by weight drop (40kg, 5 times stacking) and the hammer shots (20 times stacking). The obtained data include clear first P-arrivals in far offset distance. The energy of P-S converted waves was significantly enhanced because of the characteristics of the seismic sources. Pre-stacked images could give rise to the efficient information about the metamorphic layering of hornblende gneiss, garnet gneiss and pyroxene gneiss appearing on the surface bedrocks, together with fault systems / intrusion of pegmatite in the vicinity of the Ongul Islands. The achieved local imaging by reflections would attain one of the keys to understand the formation of the LHC, as the Pan-African mobile belt of Gondwana super-continent.