

A new airborne geophysical platform and its application in the Princess Elizabeth Land during CHINARE 32 and 33 in East Antarctica

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The ice thickness, subglacial topography and bedrock conditions of Princess Elizabeth Land (PEL) in central East Antarctic Ice Sheet (EAIS) are still unknown due to lack of direct geophysical measurements. This prevents our understanding of the ice sheet dynamics, subglacial morphology and climate evolution in the region. According to recent results from remote sensing results, it's very likely that there's a large, previously undiscovered subglacial lake and subglacial drainage networks existing beneath the ice sheet in PEL with possible subglacial canyons extend over a distance of \sim 1100 km from inland to coast. But there's no direct measurements to identify them yet. China deployed its first fixed-wing airplane named Snow Eagle 601 and implemented airborne geophysical investigation in PEL during the 32nd and 33rd Chinese National Antarctic Research Expeditions (CHINARE 32 and 33, 2015/16 and 2016/17). The HiCARS deep ice-penetrating radar system and other instruments including GT-2A gravimeter, CS-3 magnetometer, laser altimeter, GPS and camera, were installed in the airplane to measure the ice sheet and subglacial conditions, as well as bedrock geology and tectonic. The field campaign was built beside Russian airfield (ZGN) near Zhongshan Station. During CHINARE 32, the airborne surveying grid was designed as radial lines from ZGN so as to investigate the region as large as possible, and total flight lines are \sim 32 000 km. During the CHINARE 33, airborne survey will pay attention to the subglacial lake and subglacial canyons. Here, we introduce the Snow Eagle airborne geophysical platform firstly. Then, we present some preliminary results from CHINARE 32 and CHINARE 33.