



## **Sounding and Imaging of Ice Sheets Over Chinese Kunlun Station and Grove Mountains From East Antarctica as a Part of Chinese National Antarctic Research Expedition**

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The ice thickness, fine resolution internal reflecting horizons (IRHs) and distinct bottom topography measurements are essential information for improving the next generation ice sheet models. Radars for sounding the Antarctic inland glaciers should have high sensitivity to overcome large attenuation losses and appropriate operation frequency and bandwidth along with moderate focused synthetic aperture radar (SAR) algorithm to improve radar sensitivity and reduce along-track surface clutter. We developed a progressively improved ice-sounding radar system, currently known as the High-resolution Ice-sounding Radar (HRISR), for sounding ice sheets both on long- and short-range vehicle-mounted survey, as a part of Chinese National Antarctic Research Expedition (CHINARE). We have sounded many key areas from the East Antarctic Ice Sheets (EAIS), including two major transects over Chinese Kunlun Station and Grove Mountains. We developed two focused SAR algorithm named the modified range migration algorithm using curvelets and the modified nonlinear Chirp Scaling (CS) algorithm to effectively reduce along-track surface clutter from collected data. In this paper, we describe the radar system and algorithms, and provide sample results to demonstrate the successful sounding of the ice sheet over the Antarctic ice sheets.