

AN OVERVIEW OF SHALLOW ICE CORES ALONG THE TRANSECT FROM COAST TO DOME A, EAST ANTARCTICA

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Shallow ice cores are crucial for reconstructing climate variability over the past several hundred to thousands of years, as well as for understanding the underlying mechanisms driving these changes. To date, the Chinese inland Antarctic expedition team has recovered more than ten shallow ice cores (> ~50 m in depth) along the transect from the coastal Zhongshan Station to Dome A, the summit of the Antarctic ice sheet. In general, three generations of electromechanical ice core drills have been employed to extract these cores. The first-generation drill, developed by the Lanzhou Institute of Glaciology and Cryopedology, has relatively unstable performance and requires operators with specialized experience. The second-generation drill, the “D-3” Ice Core Drill System (600-m type), was provided by the National Institute of Polar Research, Japan. The third generation is an improved version of the “D-3” system, featuring enhanced drilling efficiency and user-friendliness. These ice cores have been instrumental in studying explosive volcanic events, shifts in large-scale atmospheric circulation patterns, temperature fluctuations, sea ice extent, and the atmospheric oxidizing capacity (e.g., Li et al., 2009; Jiang et al., 2012, 2019; Li et al., 2013; An et al., 2021; Li et al., 2025).

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