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GPR Investigations of the No.12 Glacier of Laohugou Valley, Qilian Mountain, China

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Abstract

Ground-penetrating radar(GPR) was applied to investigate the ice thickness and interior structure of the No.12 Glacier of Laohugou Valley during August 2007, Qilian Mountain. Long time windows are necessary for receiving echoes from glaciers several hundreds of meters in depth. The 50MHz bistatic antenna clearly detected a bedrock return where abundant temperate ice zone were found. The ice containing water can be differentiated into several radar facies with distinct reflection characteristic. The interface of bedrock and temperate ice zone were identified and positioned. The map of ice thickness and temperate ice distribution is constructed from GPR data separately, which indicate that temperate ice distribution is connected with ice thickness and altitude of glacial surface. It is helpful to further study the production conditions of some subglacier hydrological characteristic.