



Toughening up DELORES: the evolution of the British Antarctic Survey DEep LOok Radio Echo Sounder

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DELORES is a ground-based radar designed to map the bed and internal structure of thick ice sheets. It is a monopulse radar driven by a ± 2 kV transmitter and using resistively-loaded wire dipole antennae. The recording system is based on a DC-powered digital oscilloscope. All the electronics are housed in weatherproof boxes mounted on sledges and the whole system is towed behind a snowmobile. In the 2013/14 Antarctic field season alone DELORES systems collected over 4000 km of radargrams over ice up to 2.5 km thick. The main operating area has been West Antarctica where surface conditions have varied from deep, soft snow to iron-hard sastrugi. The majority of deployments have been with two-person field teams at locations over 1000 km from support facilities. Therefore the principle design criteria has been 'tough and simple', i.e. make the system robust enough not to break and simple enough to fix with basic tools if it does. Here we describe how the engineering design has evolved over the past eight years and what future developments are planned to achieve greater reliability and versatility.