GSSI radar measurements in Antarctica 2014-2017 (IceCon - Be:Wise - Mass2Ant)

Installation of GSSI and GNSS system on skidoo

General view of installation of GSSI on skidoo seat, GNSS antenna (GNSS receiver and battery are in the Zarges box on skidoo.

The GNSS antenna pole is fixed with u-bolt on the skidoo (a 550cc, not a 300cc) and further fixed with straps. The lid of the box is not closed so as not to squeeze the antenna cable. The GSSI cable runs along the skidoo and a rope to the small sled.

View of the Compact Flash and backup/transfer USB stick.

The radar antenna is put in a small wooden box (icecon written on it) that can be fixed in the small sled or the BELARE sled.

For the purpose of fixing to the small white sled, a little wooden block is provided with two holes in it that correspond to holes in the sled. This wooden block prevents the case to move around. Make sure that the basis of the sled is dry, clean and stays dry, since water is the worst enemy of radar operations.

Two screws fix the little wooden block at the inside of the back of the sled (left side of the sled).

Top view of the back of the sled with the fixed wooden block that keeps the box in place.
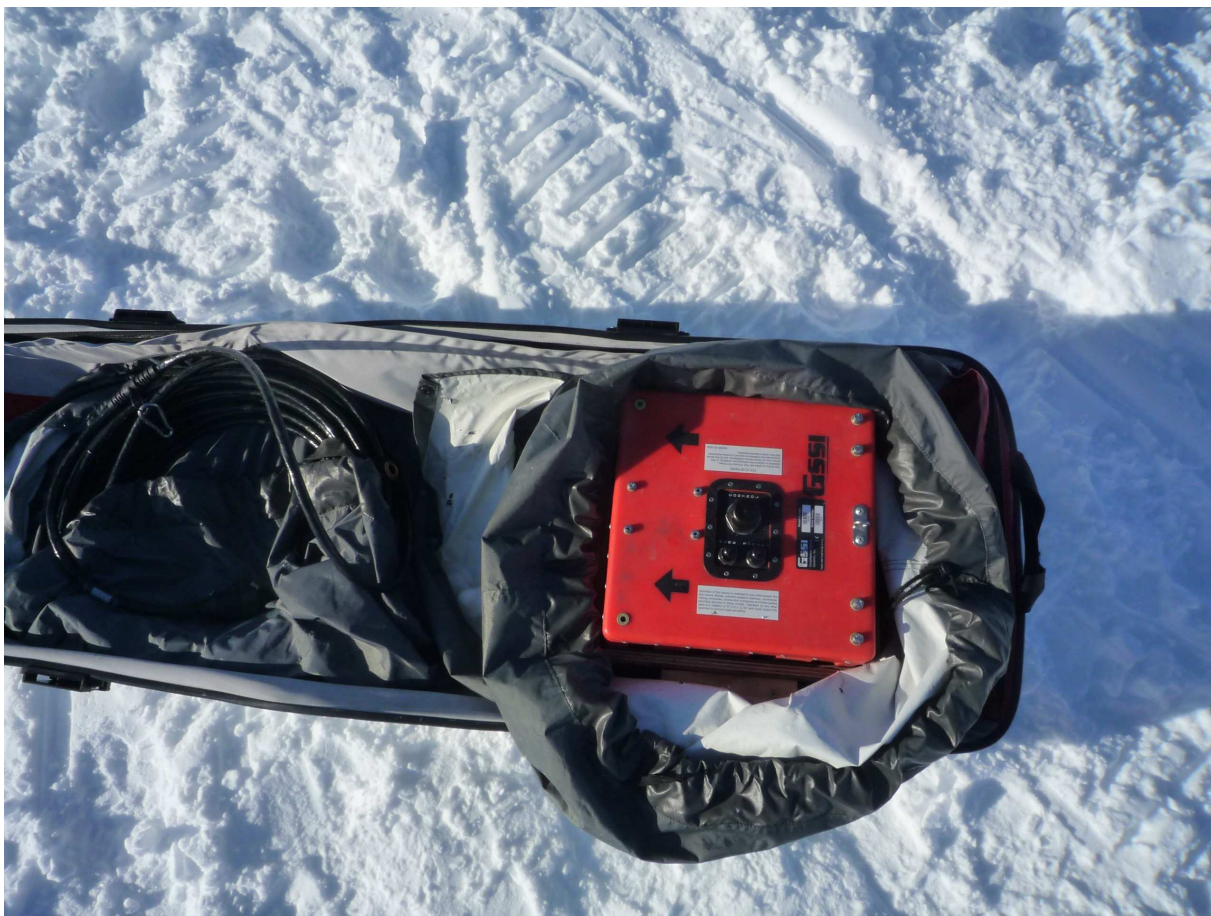
The antenna (red box) is then inserted in the wooden box. Make sure that the arrows of the antenna are pointed to the direction of the motion of the sled (front). The antenna cable (that is very long) is kept coiled in front of the antenna box Make sure that there is no strain or further coiling when directing the ends of the cable to the antenna and to the skidoo. It was found that some strain or coiling on the antenna cable gave noise to the radar measurements.

The GSSI antenna cable is connected and runs along the pulling rope. Make sure the sled is not pulled by the cable, but by the rope. A number of loops are made in the pulling rope to guide the
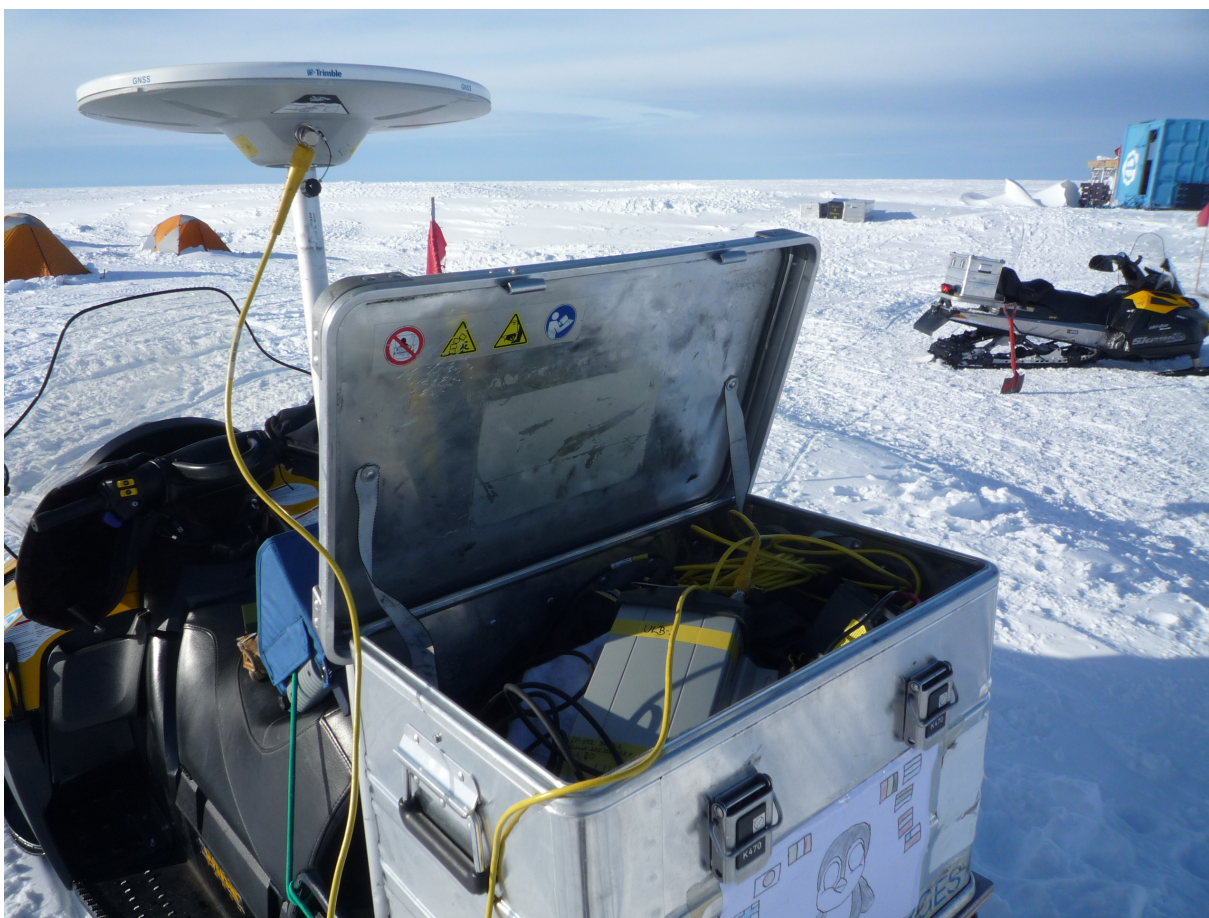
antenna cable towards the skidoo. Also important is that the cable runs to the side of the skidoo.
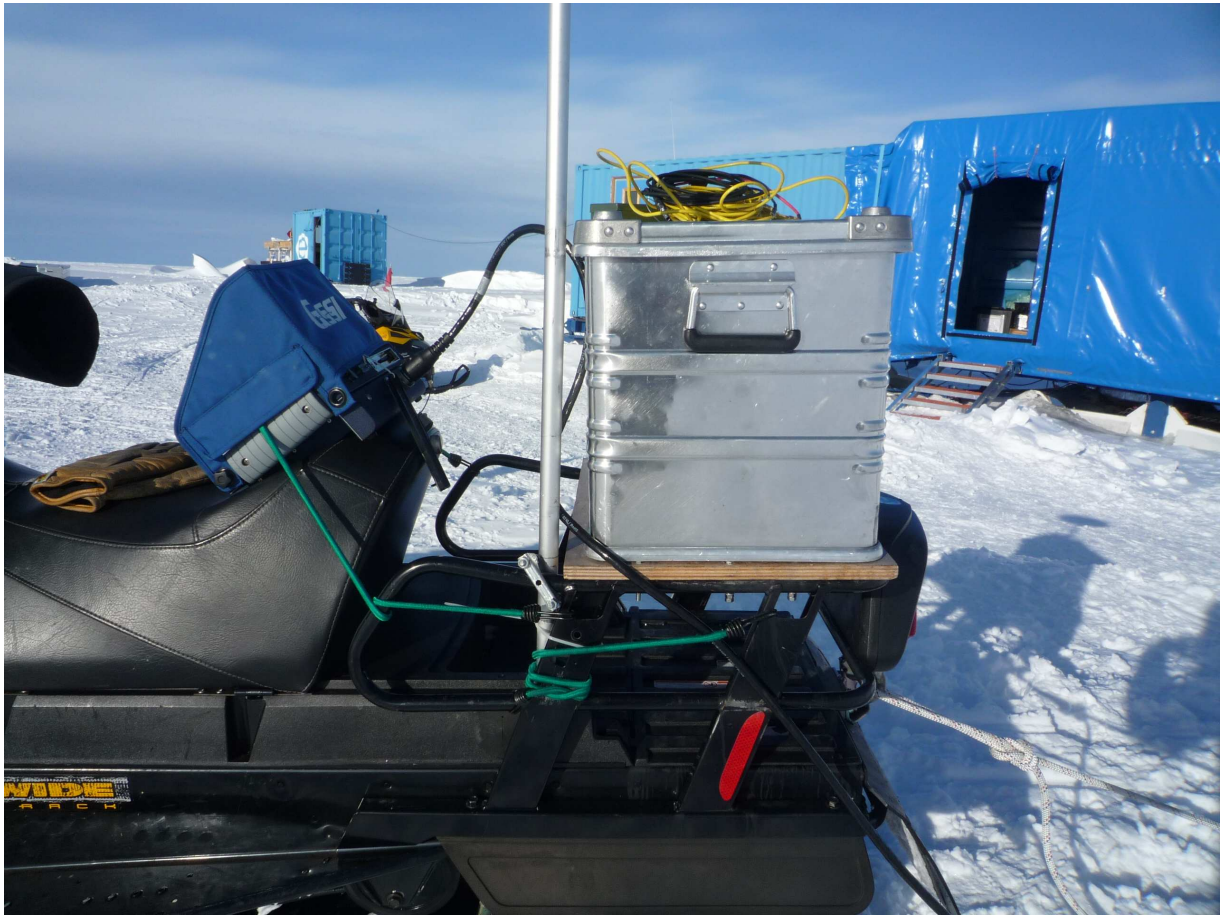
Detail of the fixing of the GSSI antenna cable onto the skidoo.

The GSSI instrument is fixed in place by an elastic strap.

The Zarges box on the skidoo has the GNSS instruments lying on top of the skidoo cover.

Connections of the GNSS system to the battery and the antenna. To start the system, simply push the on/off button. It automatically logs the data into the internal memory (which takes up very little space). Make sure that the battery charges the internal battery (that the fuse in the power cable is still OK). Spare fuses (10 mAmp) should be taken along.
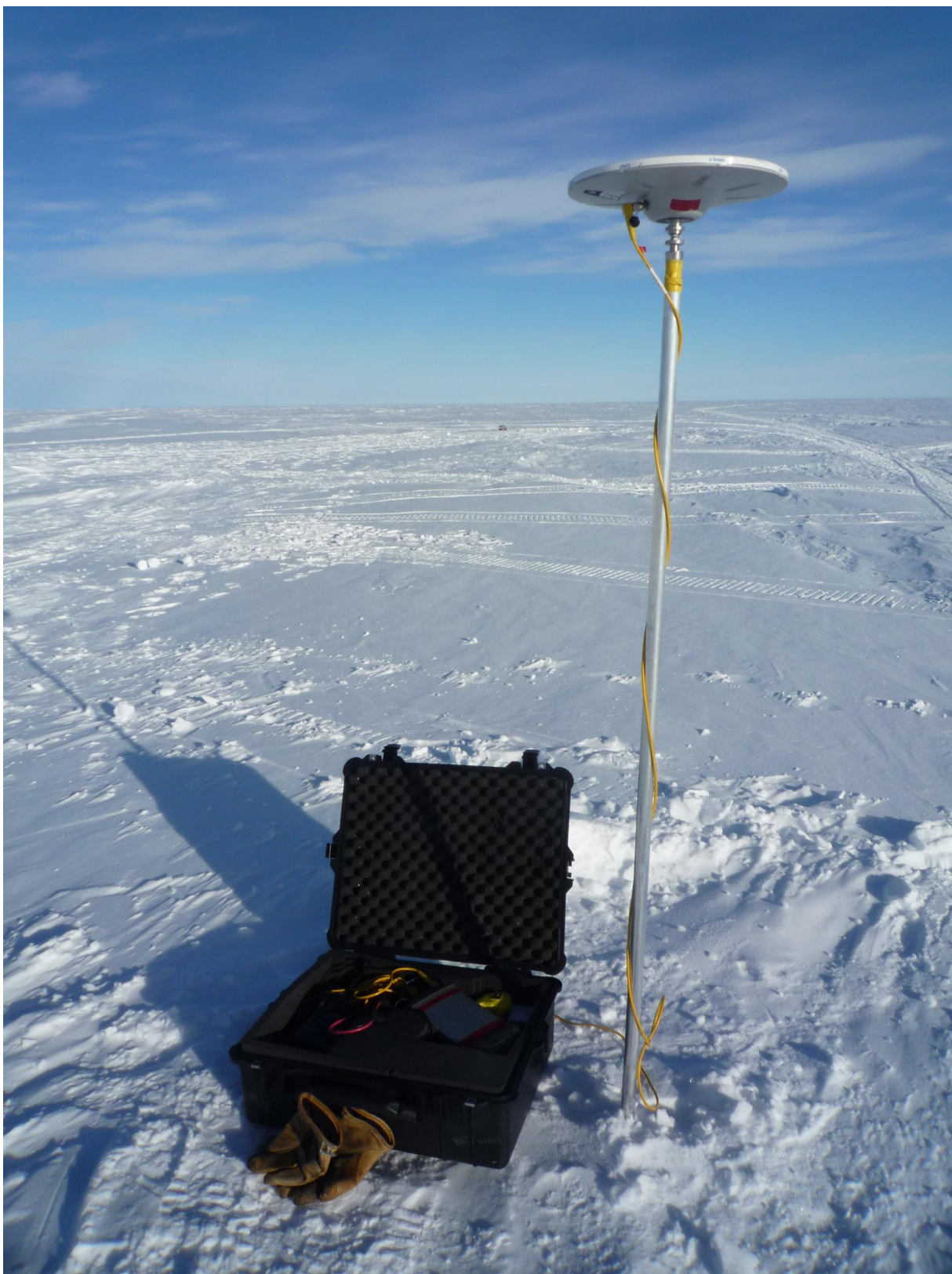
The GNSS base station with antenna fixed on base-pole, battery connected to GNSS system.
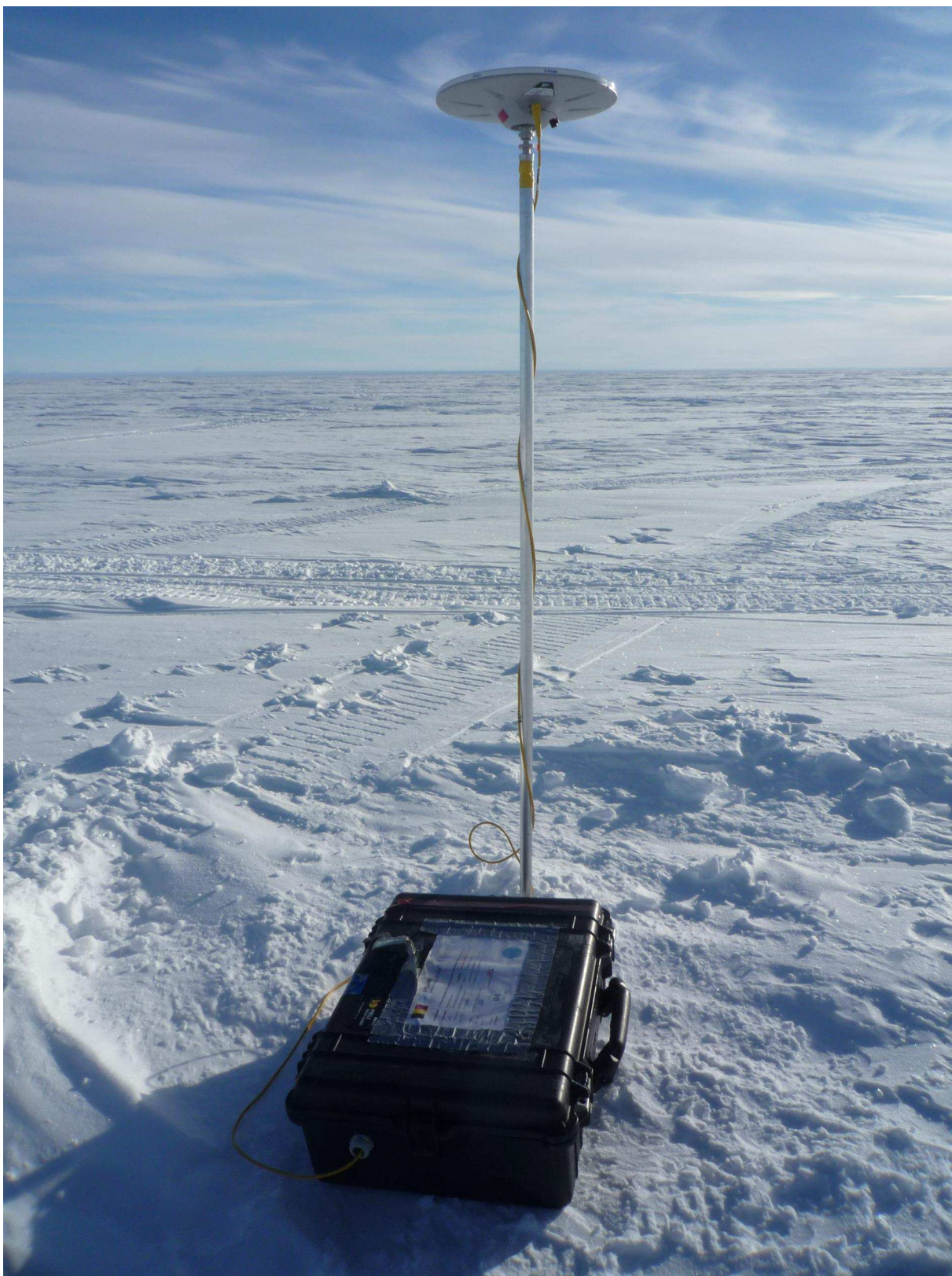
A hole in the box enables the antenna cable to exit the box while the box is perfectly sealed. Make sure that the antenna itself is oriented towards the geographic North!

General operation of the GSSI system

Limited internal memory. Put in compact flash disk and automatically files will be written on it. Copy regularly on USB stick (attention, this can take a while each time)
Internal battery is backup - it charges via direct connection or charger (separately). Ho<wever, for most operations, no charger is needed and the battery runs for 2 hours at least (there are 3 batteries).
The sled should be clean. There can be NO WATER between the antenna and the sled, otherwise bad contact.

Collection mode: RUN
Color table/frame: no gain or filter (you will see nothing on the screen)

Display

Collect
radar: 400 MHz
T rate: 100 Hz
Mode Time
GPS: none (GPS is used separately - make sure that time stamp is respected with Garmin GPS)
Matlab scripts to link GPS and radar data

SCAN

samples: 2048
Format: 16
range (ns): 600

This allows to measure 50-60 m depth
It also works for 10-12 minutes, after which the file size is too big - saving of file is then necessary

DIEL = 2.00
Rate = 10 !!!
Scan unit: not init
Gain: 24, but preferentially towards 0
        Gain is used to create your own gain function
        Best to determine this as a function of depth
        System defines a function

Positions: Offset: -20.13

Filter
First form are bandpass filters: normally not used
Stacking = 0
stacking is done spatially instead of temporally - done in postprocessing

Transfer: via flash

Time set

Synchronize with handheld GPS - keep difference to a second.