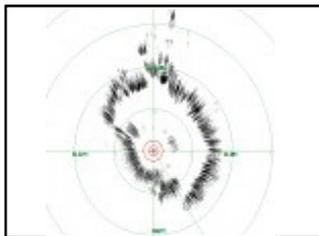
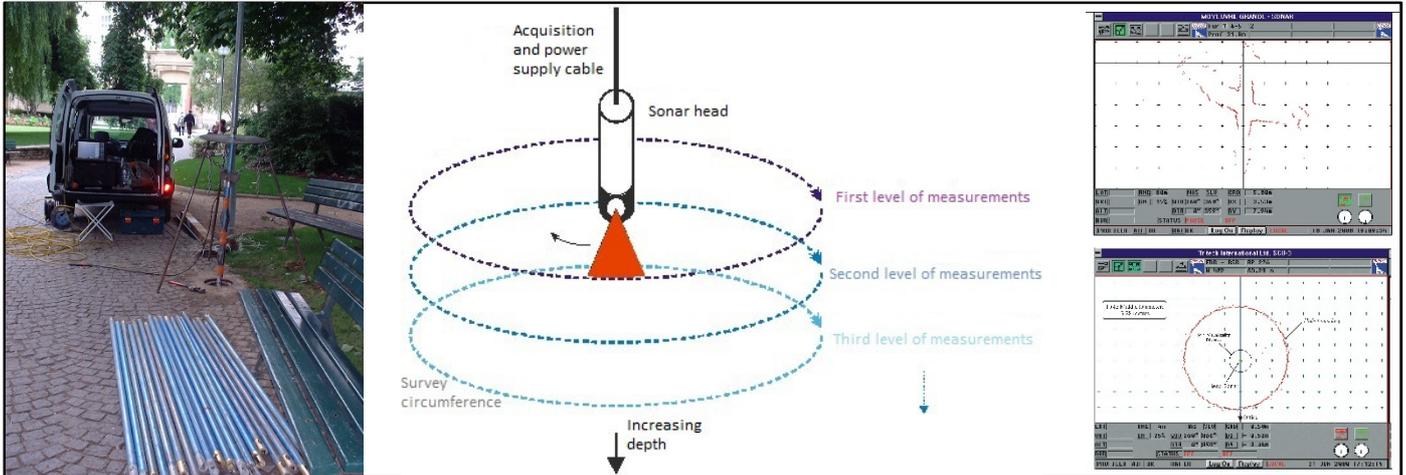




SONAR



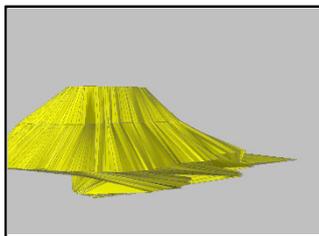
SOLDATA
GEOPHYSIC



The sonar method allows the geometry and orientation of galleries, cavities and immersed voids to be determined from boreholes using an acoustic signal.

Applications

- Establishing the size and orientation of natural or man-made cavities within the fields of urban development, studies of mining sites or old quarries
- Studying cavity risk



The principle of the sonar method is based on the reflection of an acoustic signal in a fluid due to the existence of a density contrast between the fluid and the ground. The wall of a cavity can easily be seen if the density contrast between the fluid and the ground is significant and if the wall is regular and smooth.

Sonar probes, with their protection and related material, are lowered into the boreholes with the help of rods or two cables that prevent rotations and facilitate their immobilisation.

In a gallery or a cavity filled with water, the sonar is rotated 360° with a series of measurements from 0.45° to 1.8°. This allows the walls to be visualised in a 2D plane. This imagery is performed at different levels to obtain a 3D representation of the gallery, cavity or void.

During the acquisition of the measurements, the results of different measurement levels are visualised in real time on a laptop. The location of cavities, galleries and voids is performed either using a mark on the instrumentation rods or using a gyro-compass.



Legend

1. Sonar measurements in a borehole, principle and visualisation of results on screen
2. Example of a plan survey of a natural cavity
3. 3D imagerie of a void

Key figures

- Depth of operation: up to 200m
- Maximum range: 80m with a frequency of 600kHz
- Equipment resolution: 1mm

SDG Equipment

- Sonar heads with support
- Seahub interface - power supply
- Gyro-compass
- Laptop
- Seanel Pro acquisition - visualisation software