

GeoRadar Division

GPR Configuration in Tunneling



RIS Configuration for tunneling

COMPONENTS:

- Data Logger (PC Panasonic CF 19 or other PC)
- Single or Multi Channel Control Unit (DAD 1CH or DAD MCH)
- Antenna: Single Channel Antenna (frequency fro 200 MHz up to 2 GHz) or Array of antenna (TR600V-HF, High Frequency array). All IDS Antennas
- Survey kit.



Data Logger: PC Panasonic CF 19



Data Logger: PC Hammerhead HF54



DAD-MCH
Multi Channel Control Unit



600 MHz Antenna

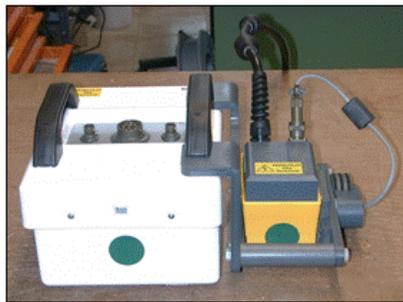


1600 MHz Antenna

ANTENNA FEATURES



TR200-400-600H Antenna



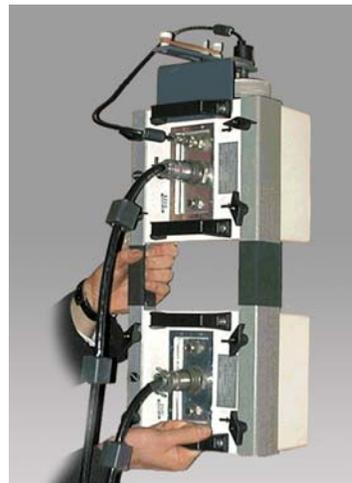
TR600V-2GHz Array



TR600V-900 Antenna



TRHF-2GHz Antenna



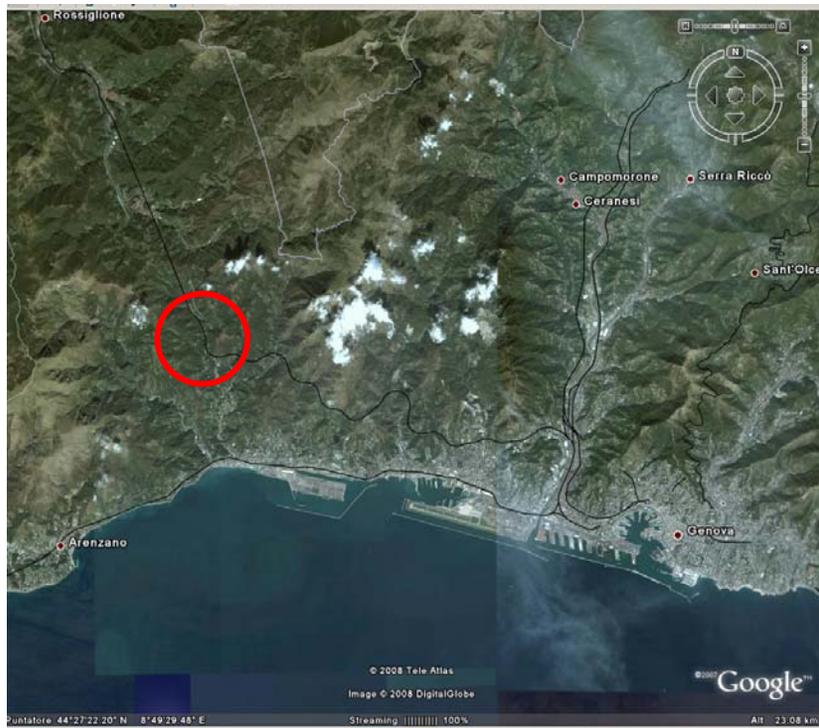
N°2 TR600V Array

- Antenna Type: Shielded Dipole
- Nominal Frequency: from 200 MHz up to 2 GHz
- 200, 400 600-H MHz Antenna
Dimensions (LxWxH): 43x37x20 cm
- 600-V MHz and 900 MHz Antenna
Dimensions (LxWxH): 20x26x20 cm
- HF (2GHz) Antenna Dimensions
(LxWxH): 13x12x8 cm
- Relative humidity: <90%
(non-condensing)
- Rain Proof (IP 65)
- Temperature: -40°C / 50°C

GPR investigation in a Tunnel along a rail track (1/2)

Geotechnical application in the Gorsexio tunnel along the rail line Genova-Ovada (Italy):

- Study of the fractures, stratigraphy and anomaly in the tunnel to evaluate the structure stability and the presence of area with a risk of water infiltration.
- Used Configuration: RIS One with 200MHz and 600 MHz Antennas

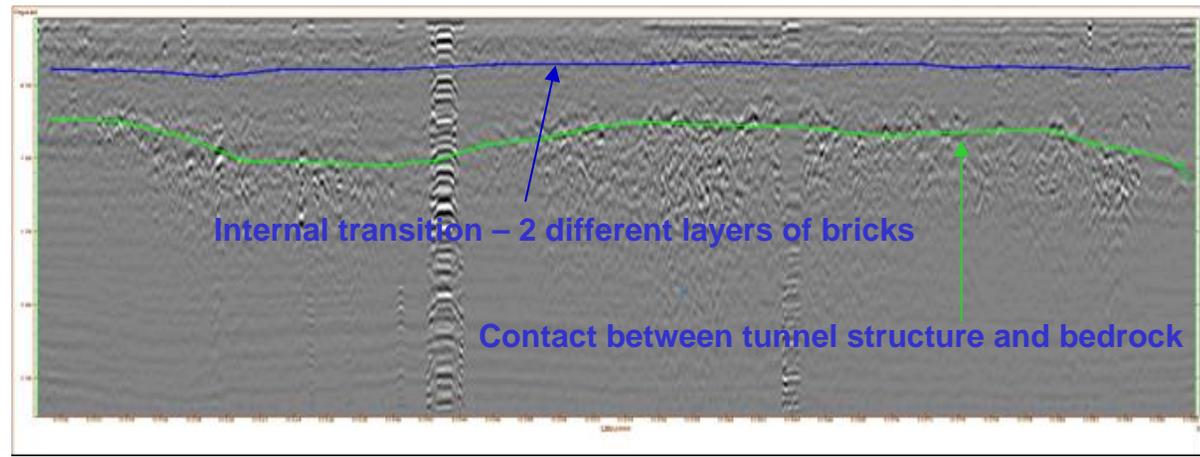


Gorsexio tunnel along the rail line Genova-Ovada (Italy)



Gorsexio Tunnel – Acquisition phase

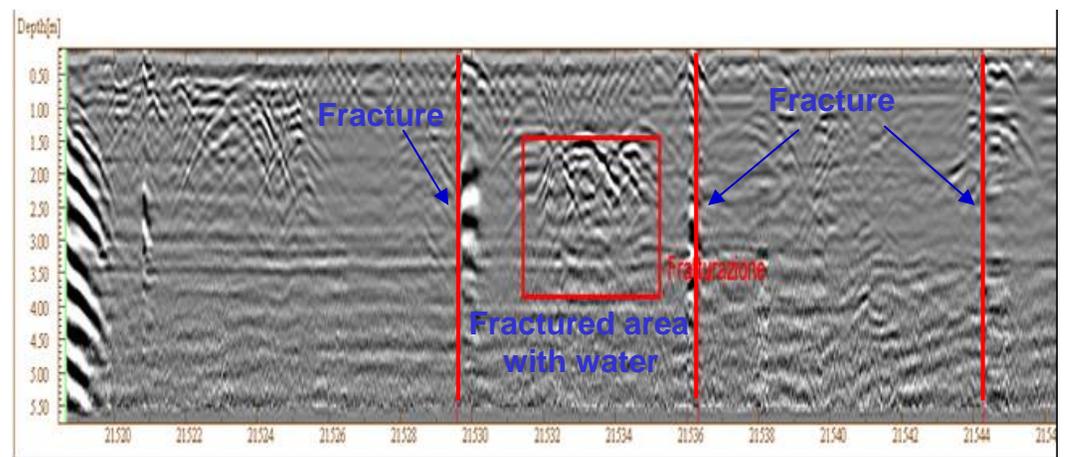
GPR investigation in a Tunnel along a rail track (2/2)



600 MHz Results

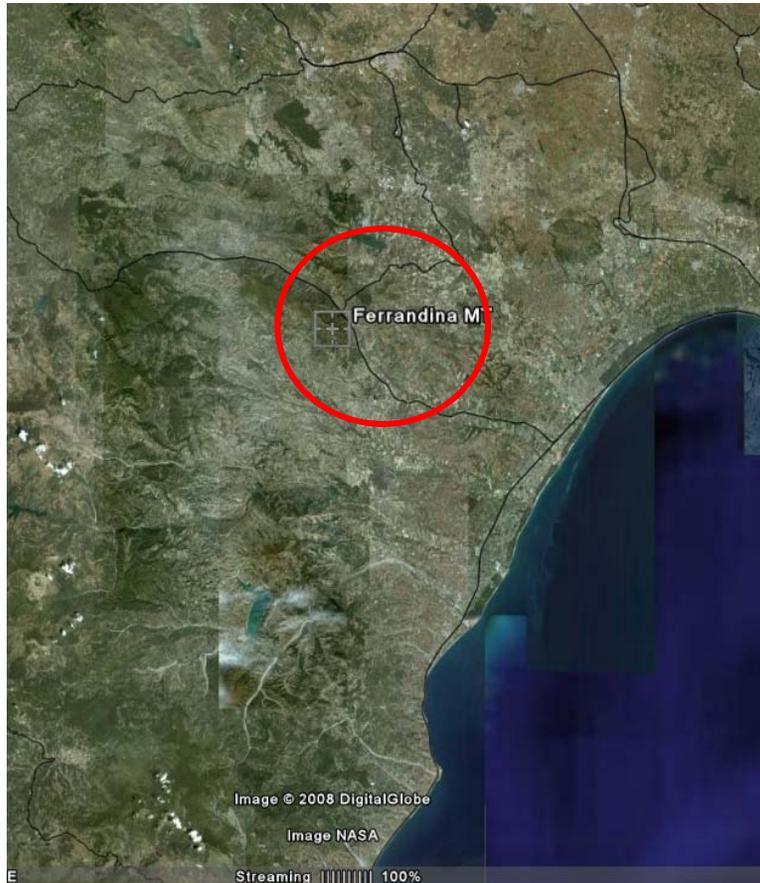


Gorsexio Tunnel Acquisition phase



200 MHz Results

GPR investigation in a Tunnel along a rail track (1/2)



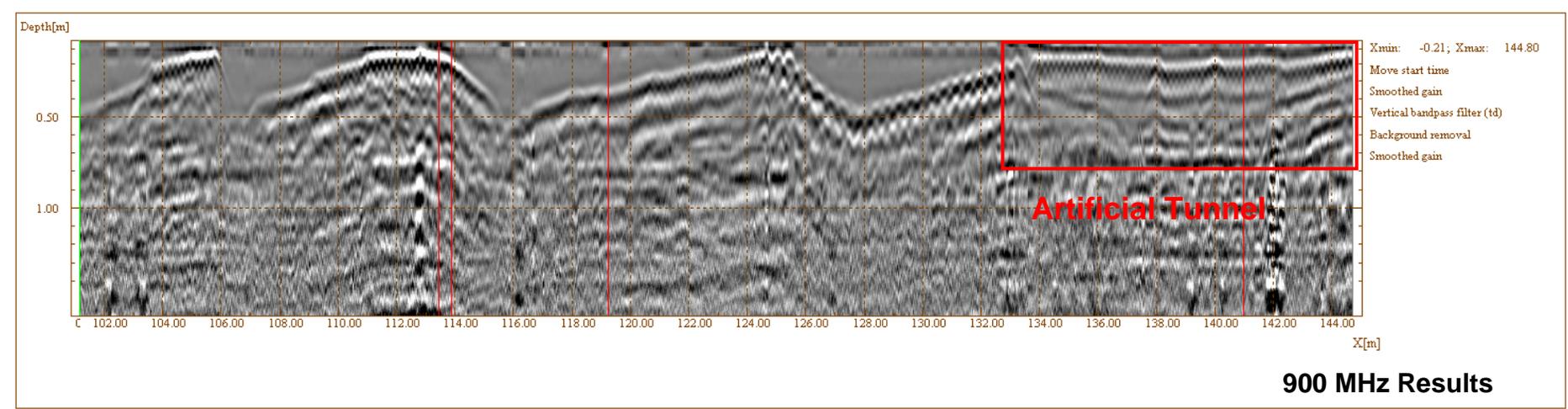
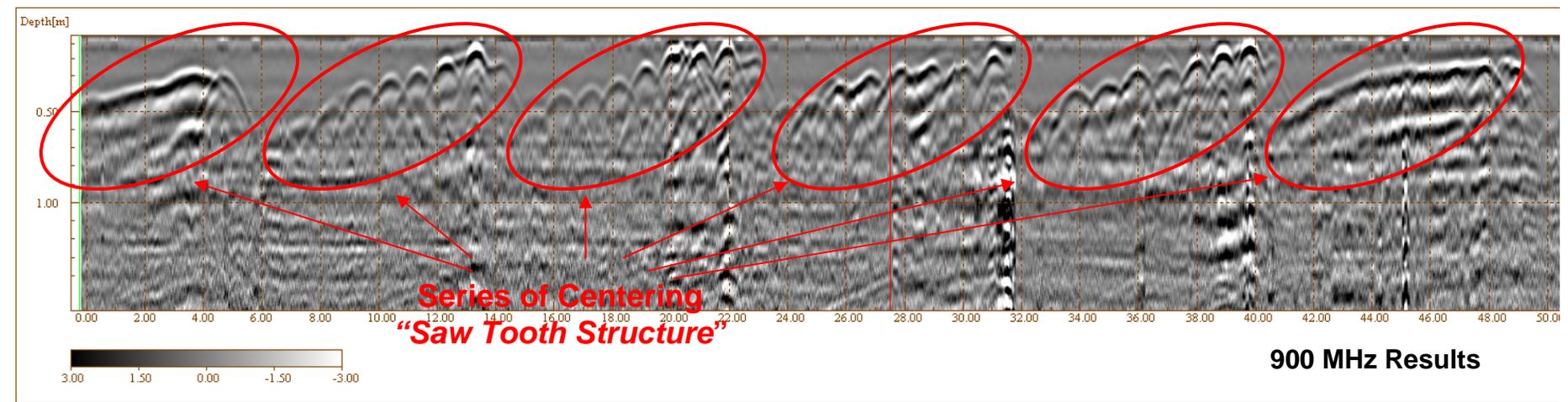
Ferrandina rail line (Italy)

Geotechnical application in a under construction Tunnel along the rail track close to Ferrandina - Matera (Italy). The GPR technique was applied to evaluate:

- The presence of the centering into the tunnel (number and depth of centering) with a “saw tooth structure”
- The presence of the artificial part of the tunnel

Used Configuration: RIS One with 900MHz Antenna

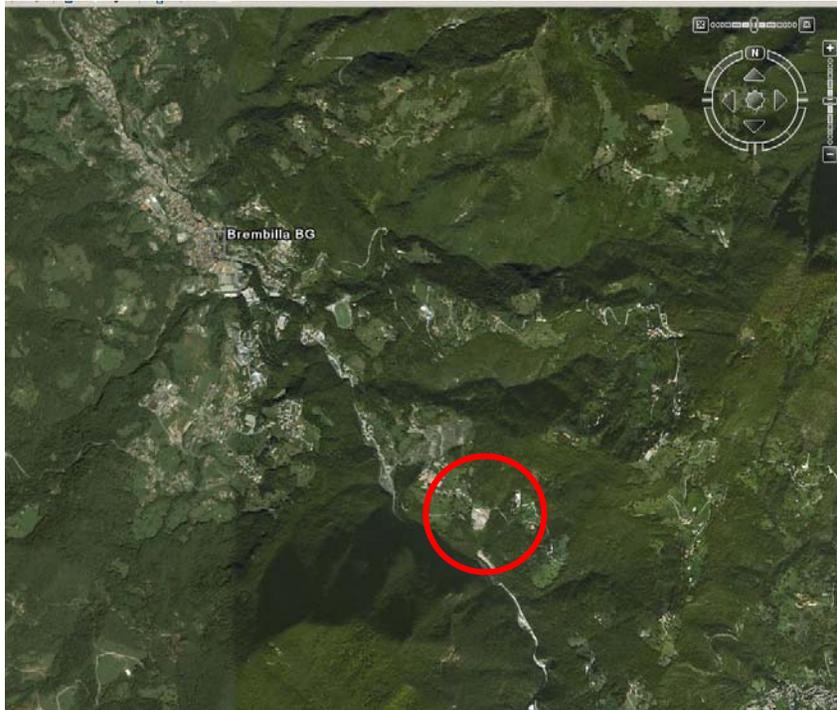
GPR investigation in a Tunnel along a rail track (2/2)



GPR Low Frequency investigation in a Tunnel of a limestone quarry (1/2)

Geotechnical application in a tunnel of a limestone quarry in Brembilla (Bergamo)-Italy:

- Study of the fractures and stratigraphy in a tunnel of the quarry to evaluate the rock stability.
- Used Configuration: RIS One with 80MHz Antenna



Brembilla Quarry -Italy

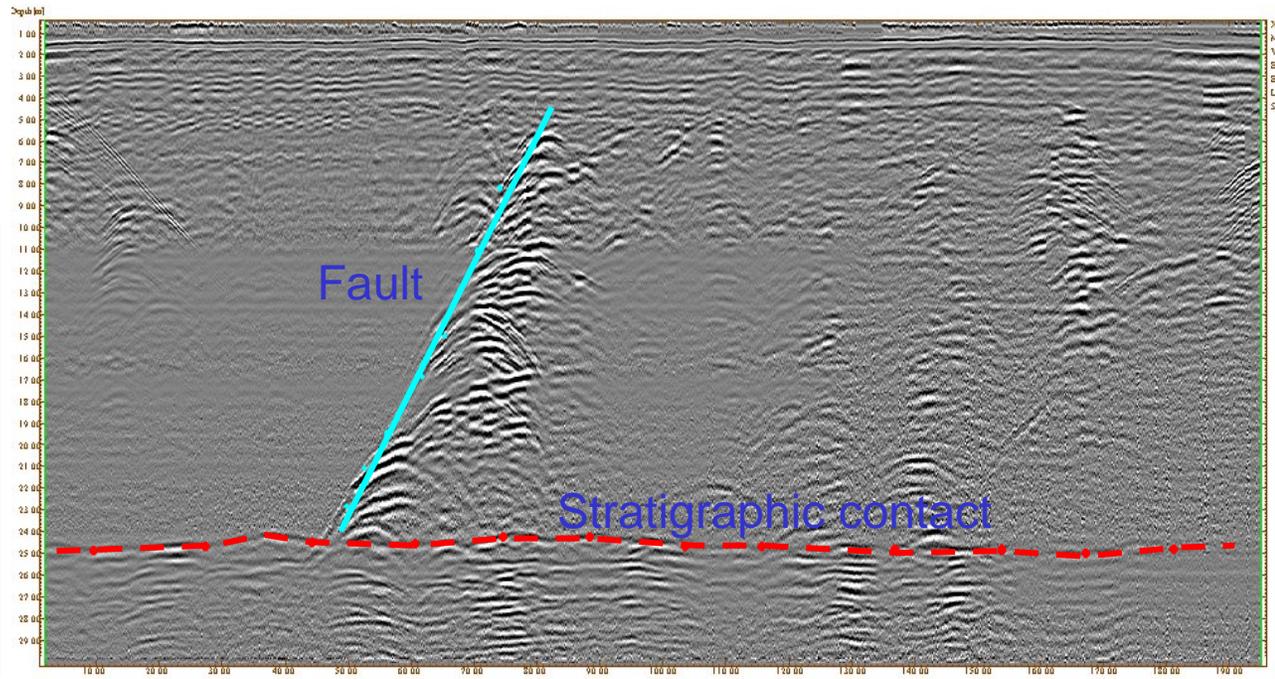


Brembilla Quarry – Italy

GPR Low Frequency investigation in a Tunnel of a limestone quarry (2/2)



RIS Configuration with 80 MHz Shielded Antenna- Acquisition Phase



80 MHz Antenna Results