Resia valley (Italy)

Situation of the valley

Stolvizza is a little village in the middle of the Resia valley in the north-eastern part of Italy. Resia valley extends for 18km from the city of Resiutta to the Mt. Canin at the eastern end of the valley. Along the valley, from the top to the bottom, flows the Resia River.

Figure 1: View of the entire valley from the top: the arrow shows the location of Stolvizza

State of art of the instrumentation and measurements in the valley at the beginning of the project

An accelerometric station, run by the Friuli Venezia Giulia Accelerometric Network (RAF), has been set in Stolvizza for site effects estimation purposes since 2001. The station is installed on a concrete plinth on a sedimentary terrace.

Apart from a very old geological map and a drilling campaign in the bottom part of the valley, the previous information about subsoil location are missing. On topographical maps it can be easily seen that the centre of Stolvizza is located on an alluvial terrace and also the surveyed areas near the village have alluvial terraces, probably a result of successive erosions of Resia River during its evolution.

Instrumentation and measurements realised in the valleys during the project

During the Sismovalp project we carries out different types of measurements and analysies: the seismic characterization for the first 30 meters of soil, the gravimetric characterization along a profile across the valley and passing through Stolvizza.

For seismic characterization of the first 30 meters we carried out measurements on 2 selected lines that were directed along the valley axes (Fifure 2). One of these passes through the accelerometric station STOL. The intergeophone distance was at 10 meters. Were used 1Hz and 4.5Hz geophones. The data were analysed with FTAN method and a hedgehog inversion was performed to calculate Vs profiles.

During the gravimetric survey we carried out measurements on 2 profiles (Figure 3). The main profile passes through the accelerometric stations STOL and starts at one end of the lower terrace. Micro-gravimetric data were able to discriminate the sediments-bedrok contrast densities in order to evaluate the bedrock mean depth through data inversion.

Gravimetric data were acquired in standard way. Field operations were performed using a gravimeter LaCoste&Romberg mod. D-018, with ZLS feedback. Standard corrections were applied to gravimetrical field data and the Bouguier anomaly was calculated.

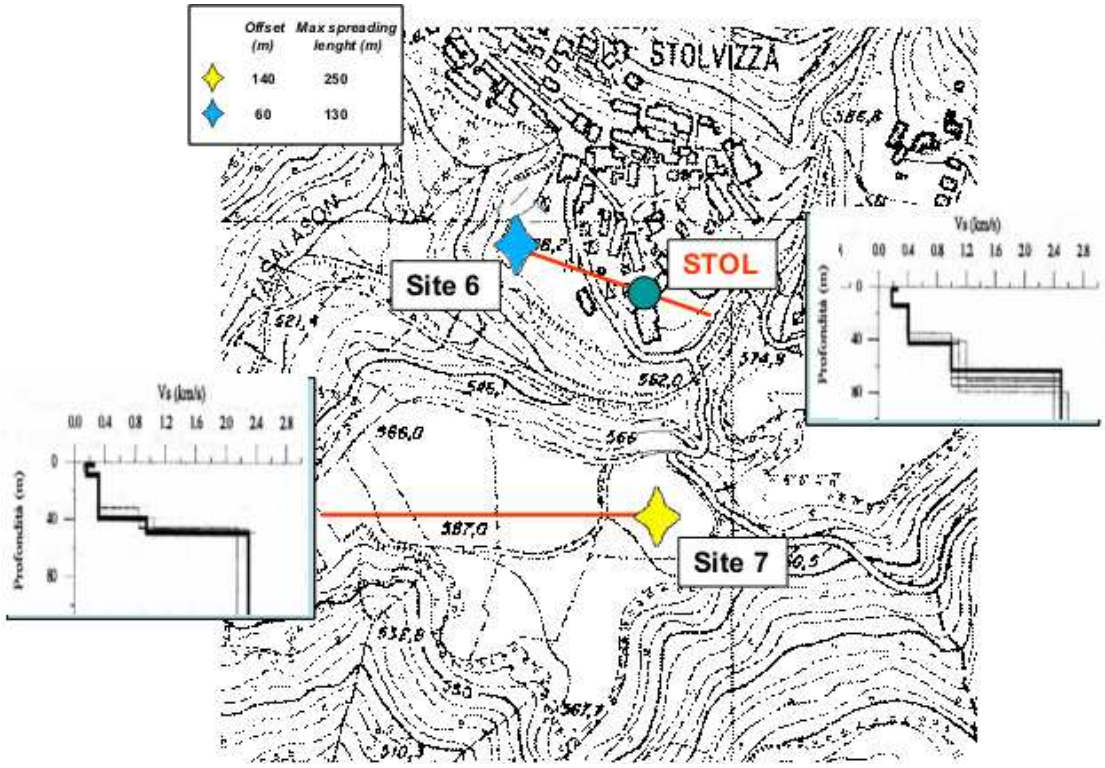


Figure 2: Seismic profiles location with the final results of data inversion

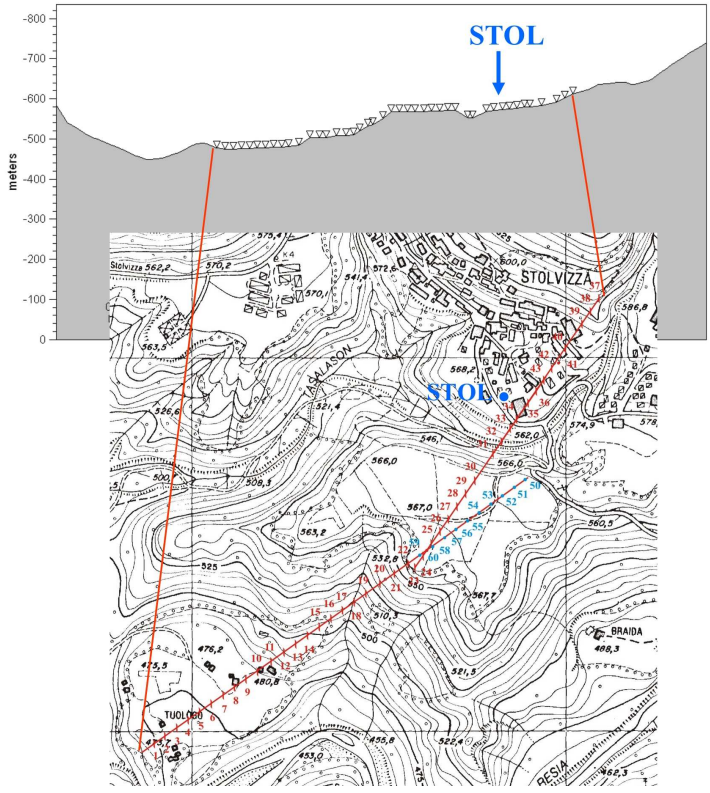
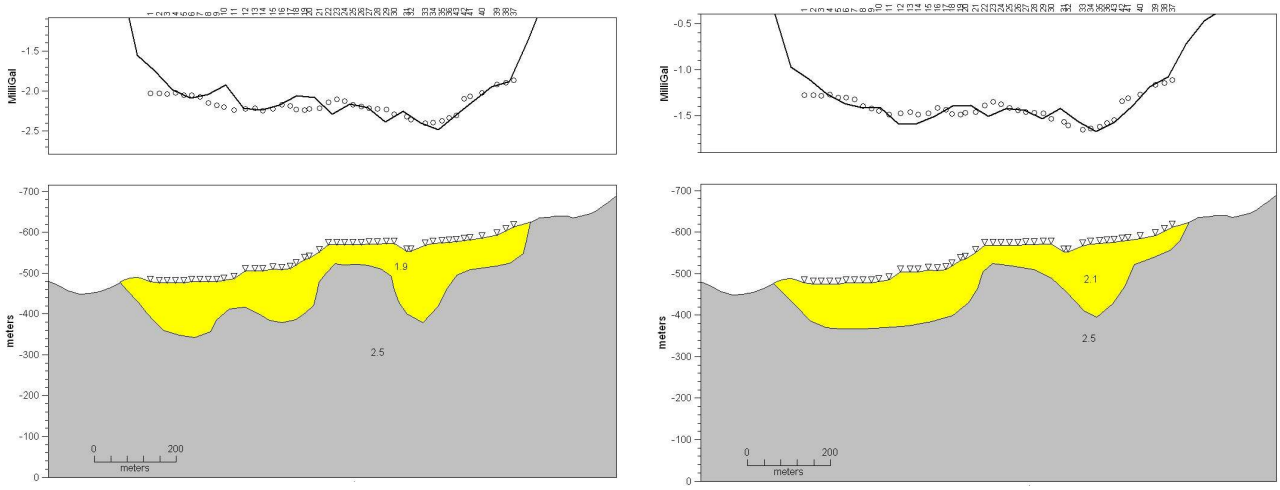


Figure 3: Map of the profile and the related topography

Results of the work done in the valley

The local field was attributed to variations of the bedrock topography. The selected model is the simplest one: the bedrock density was fixed at 2.5 kgm^{-3}, equivalent to massive carbonate rock that forms the bedrock in the surveyed area; the sedimentary layer is a single, homogeneous layer without intrusions. Because no strong constraints were available the modelling was performed using different densities form 1.9 to 2.2 kgm^{-3} and different geometries for the sedimentary layer.

Here we show the two of the possible model that better fits the anomaly.



The old accelerometer at STOL station was replaced by the newly acquired one. The recorded events have been included in the project database. During the project the site for reference (bedrock) station was identified. The new station installation will be completed very likely within the end of 2007.