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## Geological support for Sardinia ET project

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Sardinia ET project involves the realization of an underground infrastructure with two possible geometrical arrays which develop along approximately 30 km of tunnel. The site is near Sos Enattos mine (North-eastern Sardinia), where currently physics laboratories are already active.

The positioning and orientation of the infrastructure and the relative tunnel tracks were chosen taking into account the geological, hydrographic and geomorphological features of the area after a geological surveys.

In detail, the occurrence of the Mesozoic calcareous massif of Monte Albo, which is involved in thick-skinned tectonic, led to exclude the eastern side of the area. In fact, the large mass of carbonate rocks rooted within the basement, could host intense karstic circulation. The north-western area instead, is characterized only by the Palaeozoic metamorphic basement (micaschist, quartzites and orthogneiss) intruded by Variscan granites. Here, the two different designs were placed taking into account the toughness needed by rocks hosting large underground voids such as those planned at the vertices. For this reason the tracks were chosen so that vertices fell on orthogneiss and granites.

To complete the knowledge of the geotechnical properties of the rocks, a thorough physical-mechanical characterization was carried out on the lithotypes crossed by the infrastructures. Among the different parameters, dry density, water absorption, capillary water absorption, open porosity, ultrasonic speed and uniaxial compressive strength were assessed. All tests followed the UNI-EN standard procedures.

Finally, some environmental issues were addressed: the first concerning the utilization of the excavation wastes and the second the natural radioactivity by means of a radiological survey using a portable spectrometer in order to evaluate the  $^{40}\text{K}$ ,  $^{238}\text{U}$ ,  $^{232}\text{Th}$  activity in these rocks.

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