Contribution ID: **9** Type: **not specified**

SAR-GRAV: the Sardinia Underground Laboratory, a first module for the Einstein Telescope infrastructure

Thursday, March 1, 2018 3:50 PM (20 minutes)

Since 2010 the site of Sos Enattos, a former mine in the North-East Sardinia - Italy, was studied with long term seismic investigations in the framework of the site selection for the Einstein Telescope (ET). The site proved to be one of the seismically quietest places in Europe, given the local geological features and the low population density of the island. In particular, in 2012 we realized three seismic stations, one on the surface and two underground, with the deepest at -110m, providing seismic data for the following years. It allowed to characterize the local microseisms, correlating their RMS variability with meteorological and satellite data, investigating the connection with the sea waves of the near Tyrrhenian sea. The results demonstrated the compatibility with the ET site seismic requirements. Following these studies, thanks to the collaboration between Regione Sardegna, IGEA SpA, The Sassari University, INFN and INGV, a pilot laboratory named SAR-GRAV will be realized in a new cave about 5m tall, hosting a laboratory of 120m^2, that will be excaved at a depth of -110m in the next months. SAR-GRAV will be completed with a surface laboratory of about 200m^2, hosting the control room, officies, services, and the mechanical and electronic workshops. This new undergound laboratory will host experiments that require low seismic noise and controlled environment, such as ARCHIMEDES. Moreover, it can be considered a first module toward the larger ET underground infrastructure to be realized in the next decade.

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Session Classification: Development of Enabling Technologies for Gravitational Wave Detectors