Contribution ID: **176** Type: **Poster**

SUNLAB laboratory in Poland

The Sieroszowice Underground Laboratory in Poland, SUNLAB, had been discussed in a framework of the FP7 design study LAGUNA as an option for the realization of a next-generation large-volume neutrino observatory in Europe. The SUNLAB location is not under consideration in the LAGUNA-LBNO project, the follower of LAGUNA. However, the capability studies of the SUNLAB laboratory have been performed within the project UMO-2011/03/N/ST2/01971 of the Polish National Science Centre. They include sensitivity calculations, focused on the delta CP measurement and performed using the GLOBES package, for a large LArTPC detector at a distance of 950 km from CERN in a long baseline neutrino experiment. For this purpose we have simulated the neutrino beam based on the SPS proton accelerator at CERN and used the latest LAr data to simulate the detector response.
Apart from the anhydrite rock, considered in Laguna to locate the giant LAr detector, the geological structure in this region includes salt-rock characterized by extremely low level of natural radioactivity. This offers good conditions for a smaller very low background SUNLAB laboratory. Several detectors have been developed to be used in SUNLAB. For example, a low background Ge detector constructed at IFJ PAN in Kraków will be tested in the Sieroszowice mine in July this year.

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Track Classification: Other / Global Projects