

Activites at Modane Underground Laboratory

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The Modane Underground Laboratory (LSM) is located in the Fréjus roadway tunnel between France and Italy and operated since 1981. It is protected by 1700 m of rock (4800 meter water equivalent) leading to a residual muon flux of 4 muons/m²/day. The laboratory has a surface of 400 m² and a volume of 3500 m³. LSM is operated in France by CNRS and CEA and has an agreement of International associated laboratory with JINR Dubna and CTU Prague.

The low background conditions allow to host experiments looking for neutrino properties (NEMO/SuperNEMO, SEDINE, TGV) and Dark Matter (EDELWEISS). For material screening, low background High Purity Ge diodes have been developed. These detectors are also used for environmental researches (oceanography, climat, cryosphere studies, retro-observation, etc...), environmental survey and for some applications.

The laboratory hosts also test benches for the micro/nano-electronics to test failures due to the alpha radioactivity of the materials, researches on biology to understand the effects of natural radioactivity on bacteria. The laboratory wil host an optical atomic clock for some tests of relativity.

An extension of the laboratory, five times the volume of the present LSM, is under study to profit of the digging of the safety galery parallel the present tunnel. This extension will host the next generation of detectors for neutrino and astroparticle experiments as well as experiments for environmental researches, biology and microelectronics.

Primary author: Dr PIQUEMAL, Fabrice (CNRS)

Presenter: Dr PIQUEMAL, Fabrice (CNRS)

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