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LACTEL: a cosmic-ray detector in the Lac Léman

The LACTEL project proposes the development of a Water Cherenkov Detector Array (WCDA) for cosmic electron and gamma-ray observations, through the study of Extensive Air Showers (EAS).
It aims to improve gamma-ray and electron observations above 10 TeV, suppressing the hadron background through muon tagging.
Additionally, the project will also serve as a multidisciplinary platform for optical water property studies and luminous phenomena in alpine lakes.

The detector consists of several light-tight water tanks floating on the lake. Each tank accommodates a photomultiplier tube to detect the Cherenkov light produced by the charged particles of the showers.
The elementary cell of such a detector is composed of two stacked tanks: the upper one serves as a conventional WCD to detect the shower electromagnetic component, the lower one acts as a muon and hadron detector.
Repurposed optical modules from the ANTARES neutrino detector, decommissioned in 2022, will be used.

Two water tank prototypes have been installed in the Lac Léman, within the LéXPLORE research platform.
The LACTEL scientific purpose, design, and results of the first prototype tests will be presented in this contribution.

Collaboration(s)

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