Laboratoire d'Annecy de Physique des Particules

M1 Internship proposal

Title: **Measurement of the Higgs boson ZH associated production at the FCC-ee in the H→ZZ decays**

Internship supervisor

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Subject / activities

Project Summary:

The priority for the European particle physics community after the LHC is the development of an e+e- "Higgs factory" collider, that would allow the study of the Higgs boson properties with a precision complementary to that achieved by the High Luminosity run of the LHC. Such a Higgs factory could be the Future Circular Collider (FCC) project, which will use e+e- collisions in its first phase (FCC-ee) and proton-proton collisions in a second phase. Detectors with excellent particle reconstruction and identification performance will be needed to achieve a precision better than 1% on the various Higgs couplings. Several R&D projects are currently underway to develop detectors that can provide the necessary performance.

The candidate will contribute to the ongoing feasibility studies of the FCC-ee, focusing in particular to evaluate the expected performance of the measurement of the ZH production, with the Higgs boson decaying as H→ZZ, ultimately aiming at a model-independent measurement of the Higgs width at FCC. These expected results will be used as benchmarks to compare the performance of different detector designs and layout currently under study.

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