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Autore	Resseguie Elodie
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Nota di contenuto	Introduction -- Theoretical Framework -- LHC and the ATLAS Detector -- HL-LHC Inner Detector Upgrade -- W±Z Cross-Section Measurement at ps = 13 TeV -- Searches for Electroweak SUSY: Motivation and Models -- Search for wino-bino production decaying via WZ at ps = 13 TeV.
Sommario/riassunto	This thesis discusses searches for electroweakly produced supersymmetric partners of the gauge and the Higgs bosons (gauginos and higgsinos) decaying to multiple leptons, using pp collisions at sqrt (s) = 13 TeV. The thesis presents an in-depth study of multiple searches, as well as the first 13 TeV cross section measurement for the dominant background in these searches, WZ production. Two searches were performed using 36.1/fb of data: the gaugino search, which makes use of a novel kinematic variable, and the higgsino search, which produced the first higgsino limits at the LHC. A search using 139/fb of data makes use of a new technique developed in this thesis to cross check an excess of data above the background expectation in a search using a Recursive Jigsaw Reconstruction technique. None of the searches showed a significant excess of data, and limits were expanded with respect to previous results. These searches will benefit from the addition of luminosity during HL-LHC; however, the current detector will not be able to withstand the increase in radiation.

Electronics for the detector upgrade are tested and irradiated to ensure their performance.