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Searching for Doubly-Charged Vector Bileptons at LHC

In this work one investigates the LHC potential for discovering doubly-charged vector bileptons considering the measurable process p,p $\longrightarrow$ μ^{+},μ^{+},μ^{-},μ^{-},X. We perform the study assuming different bilepton masses and different exotics quark masses. The process cross-section is calculated at leading-order using the CALCHEP package. Combining this calculation with the latest ATLAS results at 7 TeV, we derive, for the first time, bounds on bilepton mass using LHC data. The results exclude bileptons with masses in the range 200 GeV to 500 GeV, depending on the exotics quarks masses. A detector simulation is also performed using the DELPHES package assuming a LHC center-of-mass energy of 13 TeV. The results of the simulation are used to obtain minimal integrated luminosities needed for discovering and for setting limits on bilepton masses at 13 TeV.

Summary

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