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Top quark physics and search for physics beyond the Standard Model at the Large Hadron Collider

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The aim of this PhD thesis is to measure the lepton flavour universality (LFU) in CMS at the Large Hadron Collider (LHC). LHC is a proton-proton collider built in Geneva, where protons collide at about $\sqrt{s} = 13$ TeV, producing a great amount of data used to study physical processes in detectors such as CMS. In this presentation, I will present as motivation for my thesis a brief review of some LFU tests in the decays of W: I will describe the discrepancy found by LEP, and the following studies made by ATLAS and CMS. I will then propose my strategy to reduce the uncertainty and produce an high precision LFU test between τ and μ at CMS, exploiting also the new statistics to be provided by Run3.

Primary author: DA MOLIN, Giacomo (LIP)

Presenter: DA MOLIN, Giacomo (LIP)

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