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Measurement of the tau polarization and the electroweak mixing angle in Z boson decays to tau leptons

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The CMS collaboration, which analyzes proton-proton collisions at CERN's Large Hadron Collider (LHC), has measured the tau leptons polarization from the decay of Z bosons with LHC Run 2 data from 2016. The polarization (helicity asymmetry) measures the different couplings of the Z boson to left- and right-handed fermions due to its electroweak nature and allows a determination of the effective electroweak mixing angle, one of the fundamental parameters of the Standard Model of particle physics. I will present the methods employed for such a measurement to be achieved and the current contributions being developed to improve the previous result. I am also contributing to the upgrade of the CMS outer tracker for the HL-LHC period and will briefly summarize the irradiation studies I am pursuing at IPHC's cyclotron CYRCé.

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