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Tau polarization effects in $\nu_\tau/\bar{\nu}_\tau$ - tungsten interactions at the LHC energies

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Considering that the study of neutrino - nucleus interactions with incident neutrino energy ranges in the GeV - TeV range is feasible at the Large Hadron Collider, we investigate in this work the degree of polarization $calP$ of the (anti) tau lepton produced in (anti) tau neutrino - tungsten interactions. In this study we also investigate the impact of the tau polarization on the pions generated in its decay. In particular, we estimate the associated pion momentum, energy and angular distributions. The contribution of the F_5 structure function to these observables is also investigated. Our results indicate that the pion properties are sensitive to the tau polarization state as well as to the magnitude of F_5.

Authors: Dr GRATIERI, Diego (Universidade Federal Fluminense); FRANCENER, Reinaldo (Universidade Estadual de Campinas); GONÇALVES, Victor (Universidade Federal de Pelotas)

Presenter: FRANCENER, Reinaldo (Universidade Estadual de Campinas)

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