Contribution ID: **101** Type: **Regular Talk (15'+5')**

Radiative corrections to $\tau \to \pi(K)\nu_\tau[\gamma]$: a reliable new physics test.

The ratios $R_{\tau/P} \equiv \Gamma(\tau \to P\nu_\tau[\gamma])/\Gamma(P \to \mu\nu_\mu[\gamma])$ $(P = \pi, K)$ provide sensitive tests of lepton universality $|g_\tau/g_\mu| = 1$ and are a useful tool for new physics searches. The radiative corrections to $R_{\tau/P}$ are computed following a large-N_C expansion to deal with hadronic effects: Chiral Perturbation Theory is enlarged by including the lightest multiplets of spin-one heavy states such that the relevant Green functions are well-behaved at high energies. We find $\delta R_{\tau/\pi} = (0.18 \pm 0.57)\%$ and $\delta R_{\tau/K} = (0.97 \pm 0.58)\%$, which imply $|g_\tau/g_\mu|_\pi = 0.9964 \pm 0.0038$ and $|g_\tau/g_\mu|_K = 0.9857 \pm 0.0078$, compatible with and at 1.8σ of lepton universality, respectively. We test unitarity and bind non-standard effective interactions with the $\tau \to P\nu_\tau[\gamma]$ decays.

Authors: Dr LÓPEZ-CASTRO, Gabriel (CINVESTAV); Dr HERNÁNDEZ-TOMÉ, Gerardo (CINVESTAV, UNAM); Dr ROIG, Pablo (CINVESTAV); Dr ROSSELL, Ignasi (CEU); ARROYO, Marco

Presenter: ARROYO, Marco

Session Classification: Theory - Phenomenology

Track Classification: Theory - Phenomenology