

# 4th Colombian Workshop on flavor physics.

Wednesday, June 15, 2022 - Friday, June 17, 2022



## Book of Abstracts



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**Morning / 1****Flavor anomalies with minimal models**

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We present a model able to solve the neutral and the charged anomalies. A discussion about the low energy and LHC constraints on these processes is presented.

**Morning / 3****Quark mixing matrix from mass matrices with the maximum number of texture zeros**

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In this work we carry out an exhaustive study to find quark mass matrices in the Standard Model (SM), with the maximum number of texture zeros consistent with the experimental data. We found four viable configurations of five texture zeros that adjust the quark masses, the mixing angles and the CP violation phase, with deviations below  $1\sigma$  level respect to the current SM best fit values. One of the most important aspects of this work is an economic procedure to find the texture zeros: we resort to the weak basis transformation method, which, as we will show, exhaustively search every possible configuration. We report various leading order relations between the mixing angles and the quark masses for each case.

**Afternoon / 5****W' model and B meson anomalies. (Cristian Garcia)**

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In recent years, evidence of Lepton Flavour Universality Violation has been observed in semi-leptonic decays associated with the charged-current transition  $\bar{c} \rightarrow \bar{s} \ell \ell$  by BABAR, Belle and LHCb experiments, up to 3 standard deviations ( $3\sigma$ ). While for the neutral-current transition  $\bar{c} \rightarrow \bar{s} \ell^+ \ell^-$ , the BABAR collaboration in 2020 reported a discrepancy of  $1.8\sigma$  in the leptonic decay of the  $Y(3s)$  meson. Since the new physics operator that modifies the charged transition also contributes to the neutral process, in this work we study the impact of these measurements on a new physics model consisting of an extra triplet of left-handed vector-bosons ( $W'$ ,  $Z'$ ) that coupled preferably to fermions of the

third family. We observe that this model cannot simultaneously explain the recent measurement obtained by BABAR for  $\Upsilon(3s)$  and the observables given by the transition  $\Upsilon \rightarrow \Upsilon \Upsilon$ .