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Spurion Analysis of the Little Flavor Model

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The Little Flavor model introduced a novel framework for understanding flavor: flavor structure is due to hierarchical breaking of the combination of vector-like symmetries and an approximate nonlinearly realized symmetry in the Higgs sector. While it was found that realistic mass hierarchies could result from physics at a few TeV, the underlying mechanism for appropriately suppressing flavor changing neutral currents (FCNC) was not understood. By carrying out a spurion analysis, we show that the suppression is due to the smallness of the Yukawa couplings in relation to the heavy vector fermion mass scale, in a way that is reminiscent of Extended Technicolor theories and is unlike Minimal Flavor Violation. This gives rise to small but potentially measurable FCNC and new Z' and W' bosons. The spurion analysis also allows us to discuss the radiative corrections to the light quark masses, a problem that plagued the original model.

Author: GRABOWSKA, Dorota (INT/UW)

Presenter: GRABOWSKA, Dorota (INT/UW)

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