

# Bayesian Exploration of Froggatt-Nielsen Mechanism

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The Froggatt-Nielsen (FN) mechanism is a compelling explanation for the hierarchical structures observed in the Yukawa couplings of fermions.

In this mechanism, the above structures are realized by imposing different  $U(1)$  charges for each generation of fermions under a new  $U(1)$  flavor symmetry. So far, several FN charge assignments have been proposed in the literature where the charge assignments have typically been determined in a heuristic way. However, it is difficult to quantitatively determine which FN charge assignment is “good.”

Besides, only a limited number of FN charge possibilities have been discussed. In this talk, we discuss the selection of phenomenologically valid FN charges within the Standard Model, considering both the seesaw mechanism and effective dimension-five operators for the neutrino masses.

We adopt Bayesian statistics in our method to conduct a thorough examination of FN charge assignments.

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