DISCRETE 2020-2021

Contribution ID: **21** Type: **not specified**

Modular Invariance, Residual Modular Symmetries and Lepton (/Quark) Masses, Mixing and CP Violation

We will discuss the approach to the flavour problem
based on modular invariance.
In modular-invariant models of flavour,
hierarchical fermion mass matrices may arise
solely due to the proximity of the modulus τ
to a point of residual symmetry.
This mechanism does not require flavon fields, and modular
weights are not analogous to Froggatt-Nielsen charges.
We show that hierarchies depend on the decomposition
of field representations under the residual symmetry group.
We systematically go through the
possible fermion field representation choices which may yield
hierarchical structures in the vicinity of symmetric points,
for the four smallest finite modular groups, isomorphic
to S_3, A_4, S_4, and A_5, as well as for their double covers.
We find a restricted set of pairs of representations for which the
discussed mechanism may produce viable fermion (charged-lepton and quark)
mass hierarchies. After formulating the conditions for obtaining a viable lepton
mixing matrix in the symmetric limit, we construct a model in which both
the charged-lepton and neutrino sectors are free from fine-tuning.

Author: Prof. PETCOV, Serguey (SISSA/INFN)

Co-authors: Dr PENEDO, Joao (CFTP, Lisbon, Portugal); Dr NOVICHKOV, Pavel (SISSA/INFN)

Presenter: Dr PENEDO, Joao (CFTP, Lisbon, Portugal)

Session Classification: Plenary

Track Classification: Monday