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A minimalist flavour symmetry for neutrinos: modular S_3

In the recent past, substantial effort has been devoted to exploring flavour symmetries to solve the flavour puzzle. However, traditional flavour symmetry models proved to be quite unsatisfactory. In 2017, a new 'bottom-up' approach based on modular invariance was suggested, wherein the Yukawa couplings of the Standard Model become modular forms. Within this framework, we addressed the following question: is it possible to employ the smallest and most minimal modular group S_3 to construct predictive neutrino mass models? As demonstrated in our work, the answer is affirmative if we assume a certain set of guiding principles that fully exploit modular invariance.

Primary author: PARRICIATU, Matteo (Istituto Nazionale di Fisica Nucleare)

Presenter: PARRICIATU, Matteo (Istituto Nazionale di Fisica Nucleare)