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Constructing Seesaw Textures in Quark-Lepton Complementarity

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We systematically construct the seesaw textures compatible with current data from generic assumptions. We use the context of extended quark-lepton complementarity, i.e., we assume that all contributing mixing angles and mass hierarchies can be described by a small quantity of the order the Cabibbo angle as a single remnant of a Grand Unified Theory. We do not impose special assumptions, such as M_R diagonal, U_l diagonal (no mixings from the lepton sector), or M_D symmetric, but discuss the most general (real) case within the type-I framework.

We demonstrate that these special cases only contribute a very small fraction of all constructed seesaw realizations. In addition, we show that often used assumptions for the hierarchies in M_D and M_R are not necessarily our most typical results. In particular, a charged lepton or quark hierarchy in M_D does not appear at all, and both strongly hierarchical or degenerate M_R's, as often used in leptogenesis models, are untypical for the normal neutrino mass hierarchy.

Since the allowed set of textures is very large, we show a subjective selection of textures only which could resists increased experimental pressure in the coming ten years. In addition, we mainly focus on the normal neutrino mass hierarchy, since renormalization group effects are small in this case, and hardly affect our procedure.

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