Phenomenology 2022 Symposium: From Virtual to Real



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On Perturbative Completions to the Neutrino Option Resolution of the Electroweak Hierarchy Problem

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I will show how the global symmetries manifest in the Type-I seesaw model can be understood to prohibit (natural) perturbative scale generation in its Majorana mass matrix, and therefore severely limit the types of ultraviolet (UV) completions that may be conceived of for the Neutrino Option (NO) resolution to the Electroweak Hierarchy Problem (Brivio & Trott 2017). After a brief review of the basics of the NO, its phenomenology, and the global symmetries present in its Lagrangian, I will systematically demonstrate how they conspire to generate no-go limitations in the simplest instances. I will also show that perturbative scenarios with enhanced BSM field content also face significant symmetry-driven constraints, before concluding with speculative comments on non-perturbative UV-completion alternative(s), and (potentially) also naturalness comments relevant to constructions involving light sterile neutrinos.

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