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Exotica and discreteness in the classification of string spectra

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I discuss the existence of discrete symmetries in the landscape of free fermionic heterotic–string vacua that were discovered via their classification by SO(10) GUT models and its subgroups such as the Pati-Salam, Flipped SU(5) and Standard-Like models. The classification is carried out by fixing a set of basis vectors and varying the GGSO projection coefficients entering the one–loop partition function. The analysis of the models is facilitated by deriving algebraic expressions for the GSO projections that enable a computerised analysis of the entire string spectrum and the scanning of large spaces of vacua. The analysis reveals discrete symmetries like the spinor-vector duality observed at the SO(10) level and the existence of exophobic Pati-Salam vacua. Contrary to the Pati–Salam case the classification shows that there are no exophobic flipped SU(5) vacua with an odd number of generations. It is observed that the standard-like models are substantially more constrained.

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