

Modular flavour symmetries from the bottom up

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I discuss the application of modular invariance to the flavour problem from a (mostly) bottom-up perspective. In this framework, Yukawa couplings and mass matrices are obtained from modular forms, which are functions of a single complex number: the modulus VEV τ . This VEV can be the only source of symmetry breaking, so no flavons need to be introduced. When τ is close to special values (those preserving residual symmetries), a hierarchical fermion mass spectrum can arise for certain field representations. To illustrate this mechanism, a non-fine-tuned model with hierarchical charged-lepton masses is presented. Some of these apparently ad hoc values of τ turn out to be justified in simple UV-motivated CP-invariant potentials, for which novel CP-breaking minima are found.

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