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Superconformal invariance on finite supersymmetric grand unification theories

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In the context of grand unification supersymmetric theories, we treated the properties of finite theories (finite on sense of his absence of UV divergences at any order in perturbative expansion) and his implementation to construct a model phenomenological viable and consistent with the supersymmetric version of the standard model (MSSM). One of the most interesting theoretical properties of these theories is the existence of a superconformal manifold generated by the operators of the finite theory in 3+1 space-time dimensions and $\mathcal{N} = 1$, and the fact that these two characteristics (finiteness and superconformal invariance). To prove that affirmation we focus our attention on the renormalization group functions β_g, β_y and γ_i, his relation with scale invariance and his role to identify generators of the superconformal manifold. This result is consistent with work of D. I. Kazakoz, in the case of $\mathcal{N} = 4$.

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