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Orbifold stability of asymptotic GUTs

In the realm of higher-dimensional grand unified theories (GUTs), the technique of orbifolding has emerged as a powerful tool to achieve spontaneous symmetry breaking by geometrical means. We use this tool to analyze the most general 5D GUT models based on the gauge groups SU(N), Sp(2N) and SO(N). We find a new physical consistency requirement, which these models have to satisfy in order to be phenomenologically viable, and which we call orbifold stability. Based on the criteria of orbifold stability, we can search for potentially interesting GUT candidates, and at the same time quickly discard any unrealistic scenario.

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