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## **SU(6) GUT breaking on a Projective Plane**

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### **Abstract:**

We consider a 6-dimensional supersymmetric SU(6) gauge theory with the two extra-dimensions compactified on a multiply-connected manifold with a non-trivial topology. The SU(6) is broken down to the Standard Model gauge groups in two steps by an orbifold projection, followed by a non-trivial orbifold projection (or Wilson line). The Higgs doublets of the low energy electroweak theory come from a chiral adjoint of SU(6). We thus have gauge-Higgs unification. The three families of the Standard Model can either be located in the 6D bulk or at 4D N=1 supersymmetric fixed points.

We calculate the Kaluza-Klein spectrum of states arising as a result of the orbifolding. We also calculate the threshold corrections to the coupling constants due to this tower of states at the lowest compactification scale. We study the regions of parameter space of this model where the threshold corrections are consistent with low energy physics. We find that there are no power law corrections to the couplings. This can lead to very interesting phenomenology.

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