

## **$E_6$ SSM vs MSSM gluino phenomenology**

The  $E_6$ SSM is a promising model based on the  $SU(3) \times SU(2) \times U(1) \times U(1)'$  subgroup of  $E_6$ . It gives a solution to the MSSM  $\mu$ -problem without introducing massless axions, gauge anomalies or cosmological domain walls. The model contains three families of complete 27's of  $E_6$ , giving a richer phenomenology than the MSSM. This poster presents a study of typical gluino decays. The  $E_6$ SSM generically has gluino cascade decay chains which are about 2 steps longer than the MSSM's due to the presence of several light neutralino states. This implies less missing (and more visible) transverse momentum in collider experiments and kinematical distributions such as  $M_{\text{eff}}$  and  $m_{T2}$  are different. Scans of parameter space and MC analysis suggest that current SUSY search strategies and exclusion limits has to be reconsidered.