

This paper discussed how evidence of quark/lepton substructure might be identified and estimated the characteristic energy scale of contact interactions. While both dijet and dimuon production could serve as sources to look for contact interactions, the dimuon events are easier to work with due to their higher precision at high energies. Muons are studied rather than electrons because even though the contact interactions should be the same for both, electrons cannot help distinguish between different models. The paper suggests two ways that the quark compositeness could affect the dimuon events, more high-invariant-mass events, and deviations from the expected angular distribution of the muons. The paper proposed two models that described the contact interactions and hoped to find a way to differentiate between the two. The two models produced two different differential cross sections for dimuon mass and angular distribution. The paper ran Monte Carlo simulations to identify differences in the predicted cross sections when compared to the standard Drell-Yan production. Using the predictions from the simulations, the paper estimated that Λ would be 30-35 TeV.

What other models other than the two the paper proposed could possibly describe the contact interactions? The paper asserts that the contact interactions would be flavor-symmetric for Λ under about 500 TeV, but what differences in muons and electrons might we see if the energy scale is above this level and what would cause the disparities?