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Study of Quark Compositeness using the Dimuon Mass Distribution in a Helicity Non-Conserving Model in High Energy p-p Collisions CHAMATH KOTTACHCHI KANKANAMGE DON, SOWJANYA GOLLAPINNI, PRAMOD LAMICHHANE, PAUL KARCHIN, Wayne State University, LEONARD SPIEGEL, FNAL — The Standard Model (SM) of particle physics predicts and explains the nature of particle processes at very high accuracy, but it does not explain everything. The SM does not predict the mass spectra of quarks & leptons as well as the number of family members in each group. A possible explanation is the existence of more fundamental particles in nature. The 4-fermion contact interaction is used to understand the compositeness of quarks and leptons with more basic constituents called preons. Using contact interactions in the helicity non-conserving model of quark compositeness, the predicted dimuon mass distribution is studied at a center of mass energy of 8 TeV for proton-proton collisions with compositeness energy scales ranging from 3 TeV to 30 TeV. Dimuon events are generated using the Monte Carlo generator Pythia 6.4. We have shown that the mean dimuon mass in contact interactions decreases with increasing compositeness energy scale. The results are compared with the mean dimuon mass distribution of the Drell Yan process.

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