

DIS2011

Electroweak Physics and Beyond the Standard Model Parallel Session VI, Wednesday 13th of April 2011, 11:15-13:00

Title: Search for Contact Interactions at HERA

TBA

A search for physics beyond the SM in DIS events at high Q^2 is performed in ep collisions at HERA. The full H1 data, including the polarized collisions from the HERA II running, is employed. No significant deviation from the SM is observed. Limits on the quark radius and in various Contact Interaction models are derived.

Title: e⁻H Parity Violating Deep Inelastic Scattering (PVDIS) at JLab with SoLID

Paul Souder (Syracuse University) (for Wednesday)

The observation of parity-violation in deep inelastic scattering from deuterium was one of the key experiments that established the Standard Model. With the advent of the 12 GeV upgrade at JLab, we can perform a new version of that classic experiment with greatly reduced errors. The new experiment will improve the sensitivity to the axial hadronic coupling constants to neutral currents by more than an order of magnitude. In addition, the experiment can detect the presence of isospin violation at the quark level. Finally, we are sensitive to the presence of di-quarks in the nucleon. With a hydrogen target, the apparatus can measure the ratio of d/u quarks at large Bjorken x . The apparatus will be based on a large solenoid magnet. After passing through a series of baffles that eliminate neutral particles and low momentum particles, the electrons will be detected by GEM detectors. A calorimeter and a Cerenkov detector will provide triggering and identification of the electrons. Pipeline electronics will be needed to handle the large data rates.

Title: e⁻H Parity Violating Deep Inelastic Scattering (PVDIS) at CEBAF 6 GeV

Kai Pan (MIT)

The parity violating (PV) asymmetry A_d in e⁻H deep inelastic scattering was measured in Hall A at Jefferson Lab at $Q^2=1.11$ and 1.90 (GeV/c)² at $x\sim 0.3$ to a statistical precision of 3% and 4% respectively. The combination of the two measurements will provide the first significant constraint on higher-twist (HT) effects in PVDIS. With HT effects thus measured, this experiment will constrain the poorly known effective weak coupling constant combination ($2C_{2u} - C_{2d}$). The measurement will also allow the extraction of couplings C_{3q} from high energy μ -C DIS data. Precision measurements of all these phenomenological couplings are essential to comprehensively search for possible physics beyond the Standard Model. The experiment DAQ system will be introduced. Current data analysis progress and preliminary results will be presented.

Title: Flavored Dark Matter

Jennifer Kile (Northwestern U.)

We consider the hypothesis that dark matter communicates with the Standard Model via flavor interactions. We take the dark matter to belong to a "dark sector" which contains at least two types, or "flavors", of particles and then hypothesize that the Standard Model fields and dark matter share a common interaction which depends on flavor. As, generically, interaction

eigenstates and mass eigenstates need not coincide, we consider both flavor-changing and flavor-conserving interactions. We consider constraints on these interactions in a model-independent manner using meson decays, kaon mixing, direct detection, and current collider bounds. We then examine their relevance for LHC.