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Detector Optimization for Fermilab E906¹ ALDO RAELIARI-JAONA, Abilene Christian University, FERMILAB E906 COLLABORATION — The goal of Fermilab experiment E906 is to extend the measurements made by its predecessor, E866/NuSea, whose result contradicted flavor symmetry in the nucleonic sea. E866/NuSea measured the Drell-Yan (D-Y) cross-sections for fixed target proton-proton and proton-deuterium collisions at the beam momentum of 800 GeV/c, and extracted the light anti-quark distribution ratio of anti-down (\bar{d}) to antiup (\bar{u}) quarks inside the nucleonic sea for various momentum fractions (Bjorken-x) up to 0.345. By using the Fermilab Main Injector at p = 120 GeV/c, E906 will increase the number of D-Y events by approximately a factor of 50. This will result in significantly smaller errors in the region x > 0.2, where statistics for E866/NuSea were limited. We have used two Monte Carlo programs to optimize the E906 detector for acceptance, multiple scattering, and background rates. One is based on GEANT4, and the other is a fast Monte Carlo written specifically for D-Y events. The results and methods for each of these will be presented to demonstrate balancing an all-inclusive type model, which can be slow (GEANT), versus a faster M.C. approach that includes only the minimal details of the interactions.

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