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Dilution factor calculation and its Contribution to SpinQuest Systematic Error ANCHIT ARORA, University of Virginia — The contribution to the spin of a nucleon from its constituent partons is still under intense investigation. The SpinQuest experiment aims to add to the information available on sea-quarks by measuring their Sivers function. To separate the contributions of $\bar{u}$ and $\bar{d}$ quarks to the Sivers asymmetry, the experiment uses both NH_3 and ND_3 polarized targets, interacting with an incoming unpolarized 120 GeV/c proton beam. The dimuons from the Drell-Yan process are detected to analyze the azimuthal asymmetry. The incoming proton beam will also interact with other materials that are present in the experimental beam path, such as the target cell walls, the aluminum insert ladder, the microwave horn, liquid helium and nitrogen in the ammonia target. The figure of merit in our extracted Sivers function is directly dependent on both the magnitude of polarization and the interaction rate from these various unwanted materials resulting in a dilution factor. With the use of MCFM, a parton distribution based cross-section generator we can analyze the contributions from unmeasured cross-section from these various materials to find the degree of dilution and the corresponding kinematic sensitivity. This contribution to the experimental systematic error and its management.

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