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Determination of the Aluminum Background Signal Fraction in the Qweak Experiment[1] JULIE BUTLER, Erskine College, QWEAK COLLABORATION — The Qweak experiment measured a parity violating asymmetry of longitudinally polarized electrons scattered off an unpolarized liquid hydrogen (LH) target, which enabled the determination of the weak charge of the proton. The Qweak experiment measured the most precise electron-proton asymmetry, leading to the most precise determination of the weak charge of the proton. The largest source of background uncertainty comes from the aluminum casing of the LH target; instead of scattering off the LH, a fraction of the polarized electrons scattered off the aluminum casing surrounding the LH, adding to the events of interest in the asymmetry measurement. In order to obtain a more accurate measurement of the weak charge of the proton, the background signal fraction (BSF) due to scattering off the aluminum casing must be removed from the Qweak data. A new approach to this correction is proposed here, which uses the rates from the target when it was filled with a low density hydrogen gas and then scaled up to the rate of the LH target. Though this method introduced a new error, the uncertainty of the density of the hydrogen gas, but it removes sensitivity to errors from previous analysis, and should result in the same BSF as the previous method, but with a smaller error.

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