Probing for high momentum protons in $^4$He via the $^4$He(e,e'p)X reaction\textsuperscript{1} KONRAD ANIOL, California State University, FATIHA BENMOKHTAR, Duquesne University, JEFFERSON LAB HALL A COLLABORATION COLLABORATION — Experimental cross sections for the $^4$He(e; e'p)X reaction up to a missing momentum of 0.632 GeV/c at $x_B = 1.24$ and $Q^2 = 2$ (GeV/c)$^2$ are reported. The data are compared to Relativistic Distorted Wave Impulse Approximation (RDWIA) calculations for the $^4$He(e; e'p)$^3$H channel. Significantly more events in the narrow triton missing mass region that we used, 0.017 GeV $\leq$ $E_{\text{miss}}$ $\leq$ 0.022 GeV, are measured for missing momenta $p_m \geq 0.45$ GeV/c than are predicted by the theoretical model. This narrow missing mass region was chosen to minimize ($p_{nn}$) and ($p,d$) background bleeding into the (p,t) state in the theoretical model. These excess events suggest that the effects of initial-state multi-nucleon correlations are stronger than expected by the RDWIA model. The ratio of the experimental cross sections to the theory cross sections shows a smooth dependence with missing momentum except in the region where the proton’s predicted momentum distribution has a deep minimum.

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