Internal report to E89-003 collaboration

More Comments on Juncai Manuscript dated July 26

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I have just obtained some of Udias' curves and plotted them together with my NLSH results in Fig. 1 for cross section and Fig. 2 for A_{LT}. Unlike the set from August 3, my $1p_{3/2}$ curves now include the positive-parity contaminants (as do those from Udias). These calculations employ the same assumptions as those I posted at the beginning of June (cc2, EDAIO, EMA, MMD, etc) except that the HS bound-state wave functions were replaced with NLSH wave functions provided by Udias. With eyeball normalization factors of 0.72 for $1p_{1/2}$ and 0.67 for the $1p_{3/2}$ contribution to the peak at 6.3 MeV, I obtain missing momentum distributions for $|p_m| < 250$ MeV/c that are almost identical to those of Udias. His normalization factors are a little larger (about 0.75 for both states) and upon very close examination one can see slight differences in the the $1p_{1/2}$ momentum distribution for modest p_m — these remaining differences probably arise from many technical details (slight differences in recoil and electron distortion, choice of form factors, etc) of no interest to anyone. The increasing deviations for $|p_m| > 250$ MeV/c are probably due to my approximation for the lower components, but we will need to pin down extraneous details to be sure. Most of the difference between van Orden's cross section results and the others arise from the difference between HS and NLSH wave functions and for $1p_{3/2}$ neglect of positive-parity contamination.

Fig. 2 compares various calculations for A_{LT}. The differences between van Orden and Udias mostly come from the choice of optical potential. The differences between my EMA-SV calculation and Udias for $p_m > 250$ MeV/c are probably due to approximation of lower components. The differences between SV and noSV arise mostly from the bound state and demonstrate the importance of dynamic enhancement of these lower components by scalar and vector potentials. The effect is not as large as we might like, but nevertheless is the only interesting effect we have identified with these data.

Although I have some interest in making the numerical comparison with Udias more rigorous by controlling all extraneous knobs, we should not wait for completion of that project before submitting a revised version of Juncai's manuscript. Once that comparison is optimized, I'll repeat my analysis of the lower energy data using NLSH wave functions (which appear to be better than HS) for use in the longer paper. In the meantime, I'll send Juncai the curves shown here. Note that the sentences in my *proposed revision* from Aug. 3 discussing normalization factors need to modified a bit – my calculations still give slightly smaller factors than Udias.

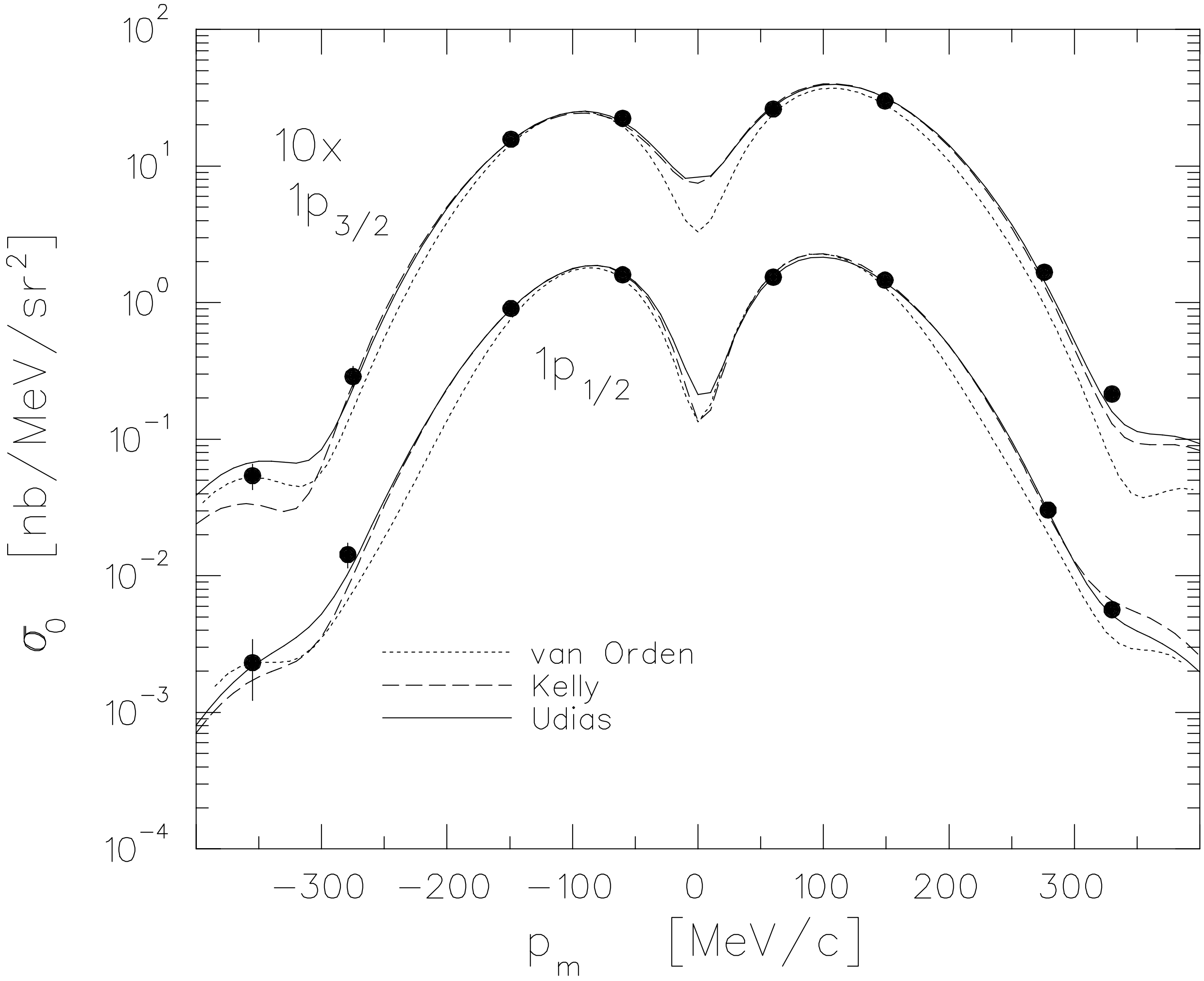

FIG. 1. Calculations of the differential cross section for $^{16}\mathrm{O}(e,e'p)$ in quasiperpendicular kinematics with $Q^2 = 0.8$ (GeV/c)^2.

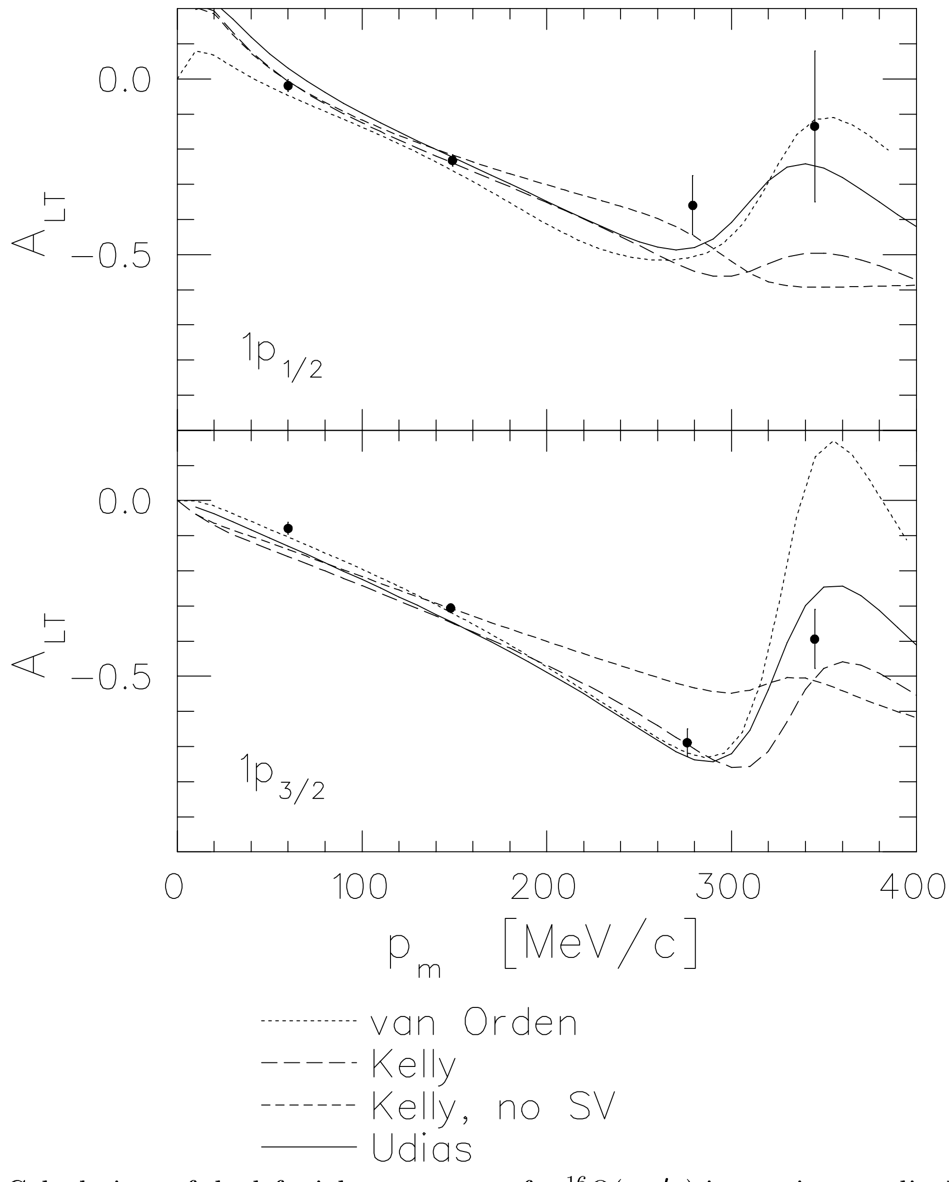

FIG. 2. Calculations of the left-right asymmetry for $^{16}\mathrm{O}(e, e'p)$ in quasiperpendicular kinematics with $Q^2 = 0.8$ $(\mathrm{GeV}/c)^2$.