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van der Steenhoven *et al.* Reply: The Comment by Lourie and Ulmer¹ on our recent Letter² asks for a further clarification of our arguments and conclusions. The authors of the Comment correctly state that a modification of the electron-proton coupling, that is identical for the longitudinal (W_L) and transverse (W_T) response functions, would go unnoticed in the ratio of reduced cross sections R . However, the experimental observation that $R \neq 1$ does imply that the e - p coupling is different in the nuclear environment. Moreover, it implies that the longitudinal and transverse response functions are affected in a different way, invalidating their assumption of equal modifications. We recall that it was the purpose of the ${}^6\text{Li}(e,e'p)$ experiment to study the density dependence of the anomalous value of R , which had been observed in the ${}^{12}\text{C}(e,e'p){}^{11}\text{B}$ experiment.³

The fact that R also depends on the level arm (ϵ_1/ϵ_2) does not influence our conclusions as has been argued in Ref. 3. There it was shown that an actual longitudinal-transverse separation reveals a similar anomaly as the quantity R . In fact, the ratio R_G , which corresponds to the ratio of magnetic over electric form factors of a bound proton,³ deviates by the same amount from the free-space value $R_G = 2.79$ for both $1s$ and $1p$ knockout² from ${}^6\text{Li}$ and $1p$ knockout³ from ${}^{12}\text{C}$.

$$S^{\text{dd}}(E_m, \mathbf{p}_m, \rho) = [\epsilon D_L^2(E_m, \mathbf{p}_m, \rho) + D_T^2(E_m, \mathbf{p}_m, \rho)] / [\epsilon F_L^2(Q^2, \rho=0) + F_T^2(Q^2, \rho=0)],$$

where ϵ represents the polarization of the virtual photon. This expression can be used to investigate the influence of a density-dependent e - p coupling, if a model is assumed to describe the density dependence.

It is possible to circumvent the model dependence of $S^{\text{dd}}(E_m, \mathbf{p}_m, \rho)$ in certain cases by using the concept of an *effective* density ρ_{eff} . It is defined as the density that

$$\rho_{\text{eff}}(p_m) = \left[\int j_l(p_m r) R_a(r) \rho(r) r^2 dr \right] \left[\int j_l(p_m r) R_a(r) r^2 dr \right]^{-1}.$$

The expansion of $F_i(Q^2, \rho(r))$ is only allowed for small $\rho(r) - \rho_{\text{eff}}$, i.e., if the major contribution to D_i stems from a limited region in $\mathbf{r}$ space. This is only valid for wave functions with $n=1$ with a single peak in $\mathbf{r}$ space. Moreover, ρ_{eff} should neither be used for large values of p_m , where the Bessel function $j_l(p_m r)$ starts to oscillate in a region where $R_a(r) \rho(r) r^2$ is still large, nor close to minima of the momentum distribution. In spite of its limited validity, $\rho_{\text{eff}}(p_m)$ is a useful concept, since it parametrizes the effect of the density on the electron-proton coupling in a kinematical range typically used in $(e, e'p)$ experiments.

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It makes little sense in our opinion to present absolute values of W_T and W_L , because these response functions contain the nuclear-structure information [the spectral function $S(E_m, \mathbf{p}_m)$] and are affected by the final-state interaction (FSI). Neither of these aspects are sufficiently well known at present. Therefore we measured a ratio, in which both $S(E_m, \mathbf{p}_m)$ and the FSI cancel to a very good approximation.

Concerning the second point raised by Lourie and Ulmer,¹ we agree that the quantity $\rho_{\text{eff}}(p_m)$ may diverge for large values of p_m . However, the concept of ρ_{eff} should not be used under these conditions. Instead, the $(e, e'p)$ cross section should be evaluated with a density-dependent form factor. Usually the $(e, e'p)$ cross section is factorized in the electron-proton coupling (σ_{e-p}) times the spectral function $S(E_m, \mathbf{p}_m)$. For a density-dependent calculation we define the following radial integral

$$D_i(E_m, \mathbf{p}_m, \rho) = (2\pi)^{-3} \int d^3r \exp(i\mathbf{p}_m \cdot \mathbf{r}) R_a(\mathbf{r}) F_i(Q^2, \rho(r)),$$

where $R_a(\mathbf{r})$ is the proton bound-state wave function and $F_i(Q^2, \rho(r))$ is a *density-dependent* form factor ($i=L, T$). Now we obtain the density-dependent spectral function

yields the same effect in a factorized formulation of the coincidence cross section as in the density-dependent calculation above. Hence the requirement is $F_i^2(Q^2, \rho_{\text{eff}}) \times S(E_m, \mathbf{p}_m) = D_i^2(E_m, \mathbf{p}_m, \rho)$, from which ρ_{eff} can be solved by a Taylor expansion in $\rho - \rho_{\text{eff}}$ of the functional $F_i(Q^2, \rho(r))$ around ρ_{eff} . One then obtains

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¹R. W. Lourie and P. E. Ulmer, preceding Comment [Phys. Rev. Lett. **59**, 1375 (1987)].

²G. van der Steenhoven *et al.*, Phys. Rev. Lett. **58**, 1727 (1987).

³G. van der Steenhoven *et al.*, Phys. Rev. Lett. **57**, 182 (1986).