Fick and Hofmann Respond: Liu, Zhang, and Shuy[1] report in the previous Comment on a distorted-wave Born-approximation (DWBA) calculation for the reaction $d+d \rightarrow n+{}^3\mathrm{He}$ near the *dd* threshold. They claim that their calculations are in vast contradiction to our results[2] obtained in the framework of the refined resonating-group model. They mention, but do not discuss, that on the other side their results are in severe disagreement with predictions of an *R*-matrix parametrization[3] of the existing data.

Even though they give some arguments on the validity of a DWBA approach for the reaction $d+d \rightarrow {}^3\mathrm{He}+n$ near threshold there are remaining doubts. Boersma[4] already studied the *dd* reactions extensively with a DWBA approach and found partial disagreement between calculations and data, except that unphysical parameters were used. Certainly further investigations are needed before a DWBA calculation can be accepted as a reasonable approach for a description of light-ion reactions near threshold. On the other hand, refined resonating-group calculations have proved their usefulness many times in this area.

However, the main arguments of Liu, Zhang, and Shuy are rather concerned with the size of the transition matrix elements (ME's) themselves. They argue that the central nucleon-nucleon force can connect *D*-state components in ^{3}He to the ${}^5S_2$ *dd* channel[5] only if a pair of nucleons in different deuterons is in a relative *D* wave by claiming that orthogonality "dictates this." This claim, however, is erroneous, because the ${}^3D_2$ and ${}^1D_2$ n-^{3}He channels contain components which agree not only in total angular momentum but in total orbital angular momentum and total spin with the ${}^5S_2$ *dd* channel; namely, in the matrix elements discussed (see Table I of Ref. 2) the ^{3}He *D* state couples with the relative orbital momentum $L'=2$ of the neutron to form a total orbital angular momentum zero. Hence, the two interacting nucleons can be in a relative *S* state and thus couple via the strong central nucleon-nucleon force with the $L=0$, $S=2$ *dd* channel (even the overlap matrix element is different from zero). In their DWBA calculation Liu, Zhang, and Shuy verify the estimate deduced from the above plausibility argument, on the basis of this wrong assumption. From their short comment we cannot decide whether the wave functions used in their DWBA approach allow for such transitions at all.

To finish, we reply to the Comment of Liu, Zhang, and Shuy on iT_{11} (A_y) at 90°. It has been well known for decades[6] and justified in the past[7] long-standing discussions—without the background of microscopic calculations—that even with vanishing $S=2$ ME's iT_{11} (A_y) does not vanish at 90° if triplet-singlet transitions (ME $\langle 11|1^-|10\rangle$) contribute. This ME, however, was not considered in our arguments since it turned out to be two orders of magnitude (!) smaller than the $L=1$ ME's in Table I of our Letter. Because presently there is no reason to doubt our calculations, a nonvanishing iT_{11} (A_y) at 90° is more likely a hint of $S=2$ contributions rather than something else.

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