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A CORRECTION TO DEUTERON STRIPPING CROSS SECTIONS

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Berkeley, California

A Correction to Deuteron Stripping Cross Sections

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The cross section for stripping 190 Mev deuterons[1] in uranium has been re-determined by fitting the data of Schecter et al[2] to new theoretical determinations of the differential cross sections. These theoretical curves were derived by including the Coulomb scattering of the emergent proton by the uranium nucleus, an effect previously neglected. The results show a significant broadening of the differential cross sections, which serve to depress the total cross section to a value only about half as great as that previously estimated. From thirteen measured proton yields at various angles and energies, as described above,[2] a new weighted mean cross section of 1.4 ± 0.2 barns was calculated. Since Coulomb scattering is negligible at these energies in the light elements, the stripping cross section of 0.35 ± 0.03 barns in beryllium or carbon is unaffected.

A further effect which has been neglected in these calculations is the diffraction of the emergent proton by the nucleus, which would tend to raise the cross section somewhat. The discrepancies between the measured values and those predicted by Serber have been previously discussed.[2]

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* California Research and Development Company.

1 R. Serber, Phys. Rev. 72, 1008 (1947).

2 L. Schecter, W. H. Crandall, G. P. Millburn, D. A. Hicks, and A. V. Shelton, Phys. Rev. 90, 633 (1953).