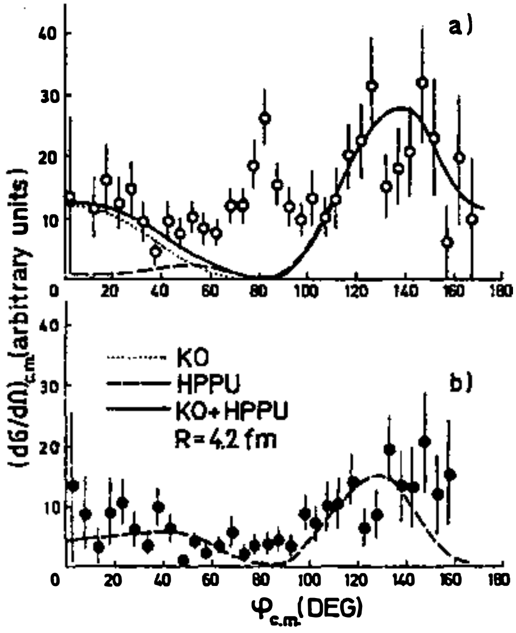
$^{11}B(n,\alpha)^8Li$ REACTION INDUCED BY 14.4-MeV NEUTRONS

B. Antolković, D.Rudar
Institute "Ruđer Bošković", Zagreb

The reaction $^{11}B(n,\alpha)^8Li$ was measured in boron-loaded nuclear emulsions used both as a target and detector. Due to the $^8Li(\beta^-)^8Be(2\alpha)$ decay, the $^{11}B(n,\alpha)^8Li$ two-body event is accompanied by two-alpha emission ("hammer track"), a feature that makes it well separated from (n,α) reactions on other light nuclei, constituents of the emulsion.

The Q value is calculated for each event, defining whether the recoil ^8Li nucleus is left in the ground or first excited 0.975-MeV state. To avoid the overlap of the data pertaining to $^8Li_{gs}$ and $^8Li_{0.975}$ as much as possible, the data with Q inbetween -6.9 and -7.3 MeV have been omitted from the analysis.

The angular distributions for the transition to $^8Li_{gs}$ and $^8Li_{0.975}$ are given in figs. a and b. The data were compared with the PWBA prediction for the KO and HPPU reactions, both of them assuming ^{11}B as being composed of an alpha particle coupled to the ^7Li core. In the ground state transition, both processes should be used to fit the forward and backward peaking. The peak around 80° cannot be fitted unless unreasonable interaction radii are used. In the transition to the first excited state the HPPU process alone fits the data rather well.



The peak around 80° is certainly due to the interference effect among the KO and HPPU processes (such an effect has already been found[1]), which take place when both processes are of almost equal intensity. The calculations along this line are in progress.

Since in the transition to the $^8Li_{0.975}$ the HPPU process is predominant, no interference takes place.

REFERENCE: 1) J.F.Cavaignac et al., Nucl. Phys. A167 (1971) 207