

NEUTRON-PAIR EMISSION FOLLOWING π^- ABSORPTION ON SOME LIGHT NUCLEI

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Large-area position-sensitive neutron counters with subnanosecond time resolution helped us to study the $(\pi^-, 2n)$ reaction with a resolution comparable to or better¹⁾ than the existing $(\pi^+, 2p)$ data.²⁾ At the same time a rather large solid angle was obtained. The measurement of the momenta of both neutrons enabled us to determine the excitation energy spectra of the residual nuclei. The momentum distributions for the absorbing nucleon pair were also extracted assuming the quasifree mechanism for the $(\pi^-, 2n)$ process.

The π^- beam obtained from the CERN SC II was brought to rest in the targets of ^9Be , ^{10}B , ^{12}C and ^{14}N . The excitation spectra of the residual nuclei were compared with the predictions based on the coefficients of fractional parentage for the removal of the two nucleons. The data and the predictions are in good agreement within the experimental resolution.^{3,4)} A surprising analogy between the excitation spectra obtained from the $(p, 2p)$ and the $(\pi^-, 2n)$ reactions for the same target nucleus was found in the energy region corresponding to the removal of the $1p$ -shell-nucleon. This could be explained by the correlation between the proton and the neutron in the same orbit which increases the absorption probability. Comparison of $(\pi^+, 2p)$ and $(\pi^-, 2n)$ data, although accumulated at different incident energies, indicated the similarity of the results for the targets studied except in the case of ^{14}N .³⁾

References

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