

## B. FEW NUCLEON PROBLEMS

### B1 Few Body Problem in Nuclear Interaction Studies

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### B2 Some Aspects of Reactions with Three Particles in Final State

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Processes responsible for most of the cross section for reactions

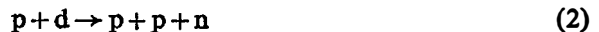


are found to be

i) the interaction of two of the final state particles, and

ii) a quasi-free process. It is possible to find the kinematic regions where only one of the processes is dominant<sup>1)</sup>. This separation is usually possible in kinematically complete experiments.

An investigation<sup>2)</sup> of the reaction



in the kinematic regions where the p-n final state interaction is a dominant process, gave a neutron-proton scattering length of  $a_{np} = -23.90 \pm 0.37$  fm. The value of  $a_{np}$  determined from neutron-proton scattering experiment was  $a_{np} = -23.678 \pm 0.028$  fm.<sup>3)</sup> Excellent agreement between these two values promises that a more accurate value of  $a_{nn}$  can be obtained from kinematically complete measurements of the  $n + d \rightarrow n + n + p$  reaction, now in progress in the Nuclear Reaction Laboratory of our Institute.

Simultaneous measurement of the quasi-free process and final state interaction contributions for reaction (2) (ref.<sup>2)</sup>) showed that the quasi-free