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Two-nucleon transfer reactions and implications for studies of unstable nuclei

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Two-nucleon transfer, such as (p,t) and (p,3He) reactions on stable nuclei, was studied extensively in the past, thereby successfully revealing crucial properties of stable nuclei. For unstable target systems this type of reaction also promises to be especially useful. However, a theoretical description of the reaction in terms of the distorted-wave Born approximation suffers from several problems. A disconcerting problem is the issue of direct, simultaneous transfer in competition with sequential transfer. At best, the existing understanding in terms of two opposing viewpoints could be described as controversial. Clearly, conclusions drawn from studies in which the reaction mechanism is not adequately understood should be treated with caution.

Current knowledge regarding two-nucleon pickup will be reviewed, and new experimental studies, which hold promise of clarifying the nature of the reaction mechanism, will be discussed.

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