

Theory of cross-section and polarization effects in $A(d,p)B$ reactions with radioactive ion beams.

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The transfer reactions (d,p) and (p,d) experiments with radioactive beams on deuteron and proton targets are receiving considerable current attention. These experiments aim to produce key information about single neutron spectroscopic strength distribution and shell structure in exotic nuclei away from the valley of stability.

On the theoretical side modern work on (d,p) reactions goes well beyond the DWBA methods used 30 years ago and includes studies of 3-body models using Faddeev methods and other approximations which attempt to give a more realistic account than the DWBA of deuteron break-up effects and other aspects of the three-body dynamics. How far do these theoretical developments alter the information about nuclear structure and the effective nucleon-nucleon interaction we can expect to extract from transfer data? In particular, what can we expect from experiments with targets of polarized deuterons and protons?