Université Paris-Saclay
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Séminaire de Physique Nucléaire Théorique

Transfer reactions for experiments : Theory and its uncertainties.

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Experiments with exotic radioactive beams often use reactions in which one nucleon is transferred between target and projectile as a tool to study spectroscopic strength of nuclear states. The information obtained, such as spectroscopic factors and asymptotic normalization coefficients, can be used, for example, to predict rates of nuclear reactions in various stellar environments. This information is obtained through comparison of the experimental cross sections with theoretical predictions. It is therefore important to have adequate theoretical models that take the most important physics of these reactions into account.
In this talk I will present the latest theoretical developments for a particular class of transfer reactions, deuteron stripping reactions (d, p) - one of the most popular tools for structure studies - and discuss their uncertainties. I will concentrate on recent advances in treating nonlocality of nucleon optical potentials within three- body description of these reactions, the role of the 3N force in the distorted wave amplitude and a microscopic approach to calculating one-nucleon removal overlap functions with correct asymptotic behaviour crucial for transfer reactions.

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