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# Study of the Coulomb breakup of halo nuclei in quantum mechanical approach

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The aim of the work is a theoretical study of Coulomb breakup of halo nuclei in the framework of a non-stationary quantum-mechanical approach.The Coulomb breakup of halo nuclei is one of the main tools in studying the properties of halo nuclei and provides useful information about the halo structure [1]. A theoretical study of exotic nuclei by quantum-mechanical approach is relevant in connection with the planned experiments aimed to investigate the properties of light nuclei on radioactive beams.
Among the halo nuclei, the 11Be nucleus is of particular importance, since the relative simplicity of its structure allows more accurate theoretical studies [2]. In fact, the bound states of 11Be nucleus can be described quite well as 10Be nucleus and a weakly bound neutron. With a good approximation, the decay can be regarded as a transition from a two-particle bound state to a continuum due to a varying Coulomb field [2].
The influence of magnetic field on the breakup of the 11Be nucleus is studied by numerical methods, in particular numerically solving the non-stationary Schrödinger equation on a radial mesh [1]. The energy levels of the 11Be nucleus for the Woods-Saxon potential and the level shifts due to the external magnetic field are calculated. Numerical results are compared with a previous calculations [2] and as an analytical method the perturbation theory [3] is applied.

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