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Double charge-exchange reactions and the effect of transfer

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Single and double charge-exchange reactions are of a great interest specially due to its connection with the Fermi and Gamow-Teller transitions and the corresponding single and double beta decays.

Within this project, charge-exchange reactions with heavy ions at intermediate energies will be performed for several neutrinoless double beta decay candidates. At these energies, there are competing channels like transfer contributing to the final double charge cross section which are not present in the correspondent beta decay. However, this can be used as an opportunity to further constrain the wavefunction of the nuclei involved: they can also be studied in terms of one and two nucleon transfer cross section which will be measured in the same experiment.

In the present contribution we will focus on the study and analysis of the transfer contribution to the charge exchange cross section for the cases studied within the NUMEN project. In particular, we will discuss about the reactions $^{40}\text{Ca}(^{18}\text{Ne},^{18}\text{O})^{40}\text{Ar}$ and $^{116}\text{Cd}(^{20}\text{Ne},^{20}\text{O})^{116}\text{Sn}$ at 15 MeV/u which will be analyzed in terms of 2nd order DWBA.

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