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Type: **Physics of Light Exotic Nuclei**

Light nuclei, challenges and experimental tools

Light nuclei are a great playground for Nuclear Physics Studies. It is a very attractive field of research as one can reach at the different Facilities all the bound isotopes for each chemical element and even peer in the unbound systems. In addition, the Q-beta value for many of these nuclei reach values near 20 MeV opening a large window for beta-decay studies. Due to their different chemical properties, their study has been in different facilities being the ISOL –ones those where the high-resolution studies can be done due to the good beam optics and higher intensities of the radioactive beams.
Near the dripline the light nuclei reach the most asymmetric N/Z bound systems. Therefore, the most exotic beta-decay have been observed in these nuclei. The recent process in beta-delayed multi-particle emission will be revised with emphasis in the experimental tools.
Furthermore, some of these light nuclei enter in the CNO and other cycles responsible for the abundances of elements below iron. Many of the nuclei participating in these processes have extremely complex decays that involve multiple decay modes. A good knowledge of the different decay branches is of great interest for nuclear astrophysics. The relatively low Q-value for particle emission made the population of levels close to particle emission available by beta decay. At the threshold of particle emission, the interplay of nuclear forces combined with structure, and electromagnetic interaction is determined by the partial decay branches for charged particles and gamma-emission. The partial decay widths have been addressed in a few cases.
The discovery of the halo structure in some of the light systems gave an extra push to the field. The importance of the continuum in the modeling of the reaction process with these nuclei have been clearly established. In fact, the beta-delayed deuteron emission by the halo nuclei also required the contribution from the continuum. To elucidate this anomalous decay beta delayed proton emission has been studied from the 1n-halo 11Be. In addition, the structure of the 2n-halo nuclei can only be understood from the 1n-less processor which structure, i.e. 10Li or 13Be, for instance, are still an open question.
In this presentation, I will present a few examples of results from ISOLDE with emphasis in the advantages of ISOL-method to do this type of studies

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