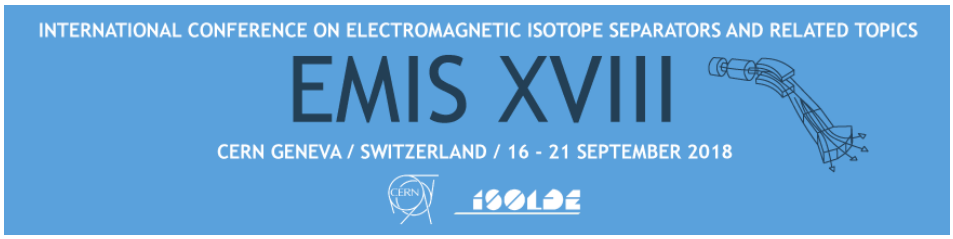

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The upgraded ISOLDE yield database: a new tool to predict beam intensities

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Developed more than 10 years ago, the ISOLDE yield database [1] serves as a valuable source for experiment planning. At the moment, it contains in total 2445 yield entries for 1333 isotopes of 74 elements and 55 different target materials. In addition, information about the time structure of the release is available for 427 yields [2].
With the increasing demand for more and more exotic beams, needs arise to extend the functionality of the database and website not only to provide information about yields determined experimentally, but also to predict yields of isotopes, which can only be measured with sophisticated setups. The individual prediction of yields is a time-consuming process in which several parameters have to be considered. The rate of radionuclides generated inside the target by the driver beam (in-target production) is the first parameter that has to be addressed by means of costly simulations. This theoretical rate is obtained with two codes that are well-benchmarked at ISOLDE: ABRABLA [3] and FLUKA [4]. Due to the limited lifetime of the radioactive species, a certain fraction of isotopes will already have decayed before having reached the ion source. This partial yield can be obtained by mathematical operations from a release curve of a longer-lived isotope of the chemical element of interest [5].
Currently, release curves for 427 yield entries are available in the yield database. Comparing the in-target production multiplied by the release fraction with the measured yield of the same isotope, allows to extract a combined parameter that accounts for ionization efficiency, chemical efficiency and other losses. For cases, in which the release is well understood, the yield database has the capability to store all the necessary data to predict yields automatically.
The website of the ISOLDE yield database is now being further developed to present this additional data. A campaign of simulations has been launched, to obtain in-target production values for all the target materials in the database, including the different proton driver beam energies (0. 6, 1.0 and 1.4 GeV) and also a possible 2.0 GeV upgrade, increasing the prediction capabilities of the database. We also contribute to the CRIBE (Chart of Radioactive Beams in Europe) project [6] aiming to establish a common yield database for operational and planned European ISOL-facilities.
Within this contribution, we present the yield predicting algorithms, including the in-target production simulations, and the new version of the ISOLDE yield database website.

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