AlphaDTL-beta

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Abstract:

Alpha-DTL is a high perfomance linac for radioisotope production.

The approach of using alpha particles beams may allow to yield radionuclides hard to be obtained with more traditional nuclear reactors or by proton accelerators, by exploiting new reaction routes. This approach may lead to better radionuclide impurity profiles, simplifying the radiochemical separation and purification process.

From the accelerator point of view, the use of cyclotron for α particles has an intensity limitation (mainly related to the extraction system): the IBA cyclotron at Arronax is for example limited to 35 microA .

The key idea of the alpha-DTL is to use a high duty cycle linac (ECRIS, RFQ, DTL), able to accelerate an average current of 0.5 mA alpha beam from few to 40 MeV, to cover the cross sections of many interesting reactions for radionuclides. The energy at the exit of the DTL will be regulated by a particular use of the stabilization system (Post couplers) of the DTL cavity.

The goal of the CSN5 experiment “alpha-DTL_beta” is to address the R&D activities recognized as critical and solve the feasibility of the accelerator for a future design report of the complete facility.

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