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Characterisation of the SpecMAT active target at ISOLDE and its physics perspectives

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The SpecMAT active target will be used to study shell evolution in exotic isotopes and investigate the fundamental aspects of the nuclear structure far from stability via transfer reactions in inverse kinematics. The SpecMAT is currently at the final developmental stage and undergoes characterisation measurements at KU Leuven and ISOLDE. During the most recent characterisation, SpecMAT was installed in the ISOLDE Solenoidal Spectrometer with a magnetic field of 2.5T. This characterisation was performed off-line using a standard alpha source. In this measurement spiral tracks of alpha particles were successfully observed in the time projection chamber of the detector. Gamma rays emitted in the decay chain of 241Am were detected in coincidence with the particle tracks by the scintillation array. With this characterisation, we demonstrated that all detector components could operate in the strong magnetic field and are ready for future on-line experiments.
In this talk recent Geant4 simulations of transfer reactions that can be studied with SpecMAT also will be presented. Using the newly developed simulation toolkit, SpecMATscint, we demonstrated the feasibility of studying the shell evolution near the doubly magic 78Ni.

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