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# EUCLIDES SI-BALL ANCILLARY DETECTOR FOR TO THE GALILEO GAMMA-RAY SPECTROMETER

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The GALILEO  $\gamma$ -ray spectrometer at Legnaro National Laboratory [1] aims at the investigations of the nuclear structure at extreme conditions. Currently, neutron deficient nuclei of interest can be produced using fusion-evaporation nuclear reactions at the high-intensity stable beams delivered by the Tandem-ALPI-PIAVE accelerator and very soon at the beams of radioactive nuclei to be delivered by the SPES facility [2]. One of the key-feature of the modern  $\gamma$ -ray spectrometers, such as GALILEO at LNL Legnaro, is its capability to identify and to study exotic excited states produced at very low cross section via fusion-evaporation reactions. Application of the EUCLIDES ancillary light-particle Si-detector improves the selectivity of different evaporation channels and reduces the Doppler broadening of peaks in the recorded  $\gamma$ -ray spectra by the event-by-event kinematic reconstruction of the trajectory of the recoiling nuclei. Constructed originally as the advanced version of the ISIS Si-ball [3] coupled to the GASP  $\gamma$ -ray spectrometer the EUCLIDES Si-ball has been recently revitalized [4]. EUCLIDES is a self-supported structure which comprises 40 dE-E telescope to reassure the maximum solid angle coverage  $\sim 80\% 4\pi$ . Considering the kinematical enlargement of the solid angle in the center of mass reference frame for a typical fusion-evaporation reaction ( $v/c \sim 5\%$ ) five the most forward positioned telescopes have the highest among the others counting rate. Therefore, these telescopes are segmented. Each of the 4 segments has an equal area and individual electronic processing circuit. The backward positioned Si-telescopes, which contribute minimum to the overall detection efficiency of light charged particles, can be dismounted, leaving, therefore, the vacant space for the installation of the plunger device [5]. It allows to combine application of Recoil Distance Doppler-Shift method together with advantages of the EUCLIDES ancillary device.

It is reported the performance of EUCLIDES coupled to the GALILEO  $\gamma$ -ray spectrometer within the first GALILEO experimental campaign finished this year [6-9].

## REFERENCES

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