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## Standardization of $^{18}\text{F}$ using new portable $4\pi\beta(LS) - \gamma$ coincidence detection system at ENEA-INMRI

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This project concerned the development at ENEA-INMRI of new in-situ  $4\pi\beta(LS) - \gamma$  coincidence detection system for activity measurement of the short half-lived radionuclides used in Nuclear Medicine. The hardware of the new portable  $4\pi\beta(LS) - \gamma$  coincidence detection system was implemented at ENEA-INMRI, in collaboration with Catania University and INFN, by adding a gamma channel on the existing TDCR portable detector available at ENEA-INMRI. A new data analysis software was developed at CAEN, independently from an existing one elaborated at ENEA-INMRI, in order to analyze the data recorded in list-mode by the new detector equipped with the CAEN desktop digitizer DT5720. The activity for short half-life radionuclides used in nuclear medicine can be then computed. Two primary activity measurement - TDCR and  $4\pi\beta(LS) - \gamma$  coincidence - methods were then used to determine the activity of  $^{18}\text{F}$  at ENEA-INMRI. The TDCR parameter is measured for  $^{18}\text{F}$  standard solution using both CAEN and ENEA-INMRI data analysis software.

**Primary authors:** ABUBAKER, Farnesk (Istituto Nazionale di Fisica Nucleare, Catania university); CAPOGNI, Marco (ENEA); TORTORICI, Francesco (Universita e INFN, Catania (IT)); Dr PEPE, Francesco (CAEN); Dr CORBO, Matteo (CAEN); Dr SUTERA, Concetta (Istituto Nazionale di Fisica Nucleare, Catania university); Prof. DE FELICE, Pierino (ENEA); Prof. BELLINI, Enzo (Universita e INFN, Catania (IT))

**Presenter:** ABUBAKER, Farnesk (Istituto Nazionale di Fisica Nucleare, Catania university)

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