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Total capture rate analysis of 136Ba target through Ordinary Muon Capture in the MONUMENT experiment

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MONUMENT (Muon Ordinary capture for NUclear Matrix element) measures Ordinary Muon Capture (OMC) on isotopes relevant for the neutrinoless double beta (0nbb) decay searches. OMC is a powerful tool to study the $0\nu\beta\beta$-decay NMEs as it involves similar momentum transfer and allows to experimentally probe the intermediate virtual transitions involved in the decay. OMC on ${}^{A}_{Z+2}X$ nucleus populates several excited states of a daughter nucleus ${}^{A}_{Z+1}Y^{*}$. The main goal of MONUMENT is to extract the total and partial muon capture rates. The total capture rate determines the lifetime of the muonic atom and can be obtained by studying the time evolution of the de-excitation of the γ rays after OMC. In this talk, I present a general overview of the MONUMENT experiment with details of the experimental setup designed to accurately extract the capture rates. I also discuss the current status of the analysis of the total capture rate of ^{136}Ba from the data taken at Paul Scherrer Institute in Switzerland during the 2021 campaign.

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