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THE MONUMENT PROJECT（20’ + 25’）

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The unknown origin of the neutrino mass has drawn attention to neutrinoless double-β (0νββ) decay, a second order process on the magnitude of the weak interaction in which two neutrons decay simultaneously into two protons, emitting only two new electrons and no antineutrinos. The discovery of 0νββ decay would establish that the neutrino is its own antiparticle and has a Majorana mass. In determining the 0νββ-decay limit, that can be translated into a limit for the mass of Majorana neutrino, the crucial role plays the calculation of the involved nuclear matrix elements (NMEs). Both processes, ⊠⊠-capture and 0νββ-decay, are governed by huge momentum transfer ≈100 MeV with no restriction on angular momentum and parity change. These features make the muon capture an attractive testing ground for nuclear model description of the NMEs for 0νββ-decay as well as for theoretical description of weak processes. At the same time, the interest of studying μ-capture is supported by a relatively good experimental accuracy of total rate measurements.

The MONUMENT experimental program includes precise measurements of the γ-ray spectrum produced following ordinary (nonradiative) muon capture (OMC). The measurement accuracy is achieved by using the high-purity germanium (HPGe) detectors. During 2021-2023 there were three experimental campaigns at the PSI (Switzerland, Villigen). The motivation, experimental setup and approaches, as well the future plans of the project will be presented in this talk.

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