

Event reconstruction in MUonE experiment at SPS accelerator

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The MUonE experiment planned to be operating at the SPS accelerator in 2021-2022 (pilot run) and 2023-26 provides a great potential to search for New Physics in the sector of the anomalous muon magnetic moment a_μ . The discrepancy between the most accurate determination of a_μ and the Standard Model predictions is about 4 standard deviations, and an analogous improvement is required in precision of theoretical prediction, dominated by uncertainty related to hadronic contribution, expected to be the main limitation of eventual discovery. MUonE experiment will allow for a precise measurement of hadronic contribution to a_μ employing the measurement of shape of differential cross section for the $\mu e \rightarrow \mu e$ elastic process. This would help to increase the significance of observed discrepancy to the level of 7 standard deviations. The crucial issue in this kind of study is the development of the event reconstruction procedures, allowing for reduction the systematic effects, and at the same time to achieve high angular resolution, together with very good precision and efficiency of the track and vertex reconstruction.

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