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The MUonE experiment at SPS

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The current theoretical prediction of the anomalous magnetic moment of the muon (a_μ) in the Standard Model reveals $\sim 5\sigma$ discrepancy when compared to experimental results. The primary source of uncertainty in the muon anomaly lies in the leading hadronic contribution to the theoretical prediction of a_μ and is expected to be the main limitation in any potential discovery. The MUonE experiment proposes a novel approach to precisely evaluate this hadronic contribution, aiming to increase the significance of the observed discrepancy. The experimental method relies on precisely measuring the of hadronic contribution to a_μ in the space-like momentum region through the $\mu e \rightarrow \mu e$ elastic scattering process.

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