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Search for the Lepton Flavor Violating decay $\mu \rightarrow e \gamma$ at high intensity muon beam facility

In the last years the experiment MEGII at PSI (Paul-Scherrer-Institut) in Switzerland has improved of two orders of magnitude the limit on the

Lepton Flavor Violating decay $\mu \rightarrow e \gamma$.

This decay is very sensitive to BSM (Beyond the Standard Model) physics.

In 2026 MEGII will complete the data taking reaching a sensitivity down to $BR(\mu \rightarrow e \gamma) < 6 \cdot 10^{-14}$.

Because this decay remains one of the most sensitive probes of BSM physics, there is strong interest in exploiting the expertise from MEGII and the new High Energy Muon Beams at PSI, that will operate after the 2028-2029 shutdown, to design a new experiment to improve the sensitivity of more than an order of magnitude.

The experiment will use a new magnetic structure and new detector technologies and be organized in two phases with increasing beam intensities.

A sketch of the experiment with different options for the two phases is illustrated.

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