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The MEGII experiment and exotic searches

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The MEG experiment searches for the $\mu^+ \rightarrow e^+ \gamma$ decay and has set the most stringent upper limit on its branching ratio $B(\mu^+ \rightarrow e^+ \gamma) < 4.2 \cdot 10^{-13}$ at 90% C.L. It is a factor 30 improvement over the previous limit set by the MEGA experiment ($B(\mu^+ \rightarrow e^+ \gamma) < 1.2 \cdot 10^{-11}$ at 90% C.L.) and also the strongest bound on any forbidden particle decay.

The compelling physics motivation to further explore the $\mu^+ \rightarrow e^+ \gamma$ decay has led the collaboration to decide upon an upgrade of the experiment, with the aim to improve the sensitivity by at least one order of magnitude. The MEG upgrade (MEGII) has been approved at PSI and by the institutions of international collaboration and is now underway with its physics run, which followed the full engineering run scheduled and accomplished during 2020-21.

MEGII started the data-taking period in 2021. 2022 represented the world record physics run in terms of the collected data sample. MEGII is expected to continue data taking for the following years until the full statistics is achieved. More exotics searches are also considered and carried out with the MEGII apparatus.

The current status of MEGII, as well as more exotic searches performed with the MEGII apparatus, will be presented.

Primary author: PAPA, Angela

Presenter: PAPA, Angela

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