

# The X17 search with the MEG II apparatus

*Friday 19 July 2024 17:36 (17 minutes)*

A resonant structure has been observed at ATOMKI in the invariant mass of electron-positron pairs, interpreted as the production of a hypothetical particle (X17).

The MEG II apparatus at PSI, designed to search for the  $\mu^+ \rightarrow e^+ \gamma$ , can perform also the X17 search.

Protons from a CW accelerator, with an energy up to 1 MeV, was delivered on a dedicated Li-based targets (with thicknesses up to several  $\mu\text{m}$ ) and the  ${}^7\text{Li}(p, e^+ e^-){}^8\text{Be}$  process studied using the MEG II spectrometer. This aims to reach a better invariant mass resolution than the previous experiments and to study the production of the X17 with a larger acceptance and therefore to shed more light on the nature of this observation.

After a 2022 engineering run, a physics run took place in 2023, during which the first data sample was collected. We report on the status of this search with the MEG II apparatus, presenting the collected data, the analysis strategy, and the current results.

## Alternate track

1. Quark and Lepton Flavour Physics

## I read the instructions above

Yes

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**Session Classification:** Beyond the Standard Model

**Track Classification:** 03. Beyond the Standard Model