

# Search for dark photons in heavy-ion collisions

Thursday 18 July 2024 12:10 (17 minutes)

The vector  $U$ -bosons, or so called ‘dark photons’, are one of the possible candidates for the dark matter mediators. We present a procedure to define theoretical constraints on the upper limit of  $\epsilon^2(M_U)$  from heavy-ion as well as  $p + p$  and  $p + A$  dilepton data from SIS to LHC energies. We used the microscopic Parton-Hadron-String Dynamics (PHSD) transport approach which reproduces well the measured dilepton spectra in  $p + p$ ,  $p + A$  and  $A + A$  collisions. In addition to the different dilepton channels originating from interactions and decays of ordinary (Standard Model) matter particles (mesons and baryons), we incorporate in the PHSD the decay of hypothetical  $U$ -bosons to dileptons,  $U \rightarrow e^+e^-$ , where the  $U$ -bosons themselves are produced by the Dalitz decay of pions,  $\eta$ -mesons, Delta resonances as well as by vector meson decays. This analysis can help to estimate the requested accuracy for future experimental searches of ‘light’ dark photons by dilepton experiments.

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1. Beyond the Standard Model

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**Session Classification:** Beyond the Standard Model

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