

The NA64 experiment for searches of rare events at CERN

We report on the recent activity of the NA64 experiment at the SPS of CERN. The NA64 experiment uses a beam dump setup to conduct missing energy searches with a high intensity electron beam.

In 2016 - 2018 separate dedicated searches for two mediators between standard model and dark sector, a new light vector boson A' and a new short-lived neutral boson X , were performed. The A' was proposed as a possible explanation for magnetic moment anomalies of muons. It could be created in electron on target reactions $e^-Z \rightarrow e^-ZA'$ and supposedly decay invisible into lighter dark sector particles ($A' \rightarrow \chi\bar{\chi}$). The X is motivated by an excess of e^+e^- -pairs in ${}^8\text{Be}^*$ excited state nuclear transitions. It could be produced in bremsstrahlung interactions $e^-Z \rightarrow e^-ZX$ and decay into standard model leptons ($X \rightarrow e^+e^-$).

We show the experimental setup and the analysis strategies of the searches for both bosons. We present the data recorded in 2016 and 2017 and show near and distant future plans of NA64.

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