

Searches for hidden particles with NA64

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NA64 is a fixed target experiment at the CERN SPS aiming at a sensitive search for hidden sectors. In this talk, we will present our latest results on the search for a new sub-GeV vector gauge boson (A') mediated dark matter (χ) production. The A' , called dark photon, could be generated in the reaction $e-Z \rightarrow e-ZA'$ of 100 GeV electrons dumped against an active target which is followed by the prompt invisible decay $A' \rightarrow \chi\chi$. The experimental signature of this process would be a clean event with an isolated electron and large missing energy in the detector. This allows us to set new limits on the γ - A' mixing strength and constrain the new parameter space for the most interesting light dark matter models.

Results on the search for the visible $A' \rightarrow e+e-$ decays, as well as $X \rightarrow e+e-$ decay of a new 17 MeV X boson, which could explain a recently observed anomaly in the 8Be transitions will be also discussed.

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