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Searches for dark photon with the ATLAS detector at the LHC

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Many extensions to the Standard Model introduce a hidden or dark sector to provide candidates for dark matter in the universe an explanation to astrophysical observations such as the positron excess observed in the cosmic radiation flux. this hidden sector could rise from an additional U(1)d gauge symmetry. The gauge boson of the dark sector would be either a massless or a massive dark photon that can either kinetically mix with the SM photon, or couple to the Higgs sector via some mediators. If dark photons decay back to the SM with a significant branching ratio, we could either observe measurable deviations in some particular Higgs decay channels or new exotic signatures that would be accessible at LHC energies. We will present a brief overview of searches of dark photon signals with the ATLAS detector, with a particular emphasis on some SM Higgs decay channels.

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