



Contribution ID: 104

Type: Oral presentation using Zoom

Probing Dark Sectors With Invisible Vector Meson Decays

Thursday, 28 October 2021 11:36 (24 minutes)

Fixed target experiments such as NA64 and LDMX use missing energy-momentum to detect the production of dark matter and other long-lived states. The most studied production mechanism is dark Bremsstrahlung through a vector mediator. In this work, we explore a complementary source of missing energy-momentum signals: Bremsstrahlung photons can convert to hard vector mesons in exclusive photoproduction processes, which then decay to dark matter or other invisible particles. We find that existing NA64 data can improve the leading constraints on invisible light vector meson decays, while a future run of LDMX could improve them by up to 5 orders of magnitude. For the examples of a dark photon and a $U(1)_B$ gauge boson mediator, accounting for meson decays substantially enhances these experiments' sensitivity, especially to thermal relic dark matter of mass $m_\chi > 0.1$ GeV. We also comment on their implications for ILC beam-dump experiments.

1st preferred time slot for your oral presentation

10:00-12:00 JST (3:00-5:00 CEST, 21:00-23:00 EDT, 18:00-20:00 PDT)

2nd preferred time slot for your oral presentation

13:00-15:00 JST (6:00-8:00 CEST, 0:00-2:00 EDT, 21:00-23:00 PDT)

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Session Classification: O-2: Fixed target / Dark sectors / Applications outside particle physics

Track Classification: Parallel sessions: Transversal Task Forces: Session O: Fixed target / Dark sectors / Applications outside particle physics