



UNIVERSIDAD TECNICA
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Seminario Grupo de Física de Altas Energías

The latest from dark photons: from kinetic mixing to stellar cooling

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Abstract

A popular choice for novel mediators between the Standard Model (SM) and a dark sector are dark photons. Kinetic mixing between the new gauge bosons and the hypercharge gauge boson result in mixing with the photon and the Z. In many setups, however, the mixing with the hypercharge gauge boson captures only part of the kinetic mixing term with the photon, since the new gauge bosons can also mix with the neutral component of the SU(2) gauge bosons. In this talk, I will take these contributions into account and present a consistent description of kinetic mixing for general Abelian gauge groups. Based on these results I will derive a low-energy theorem for the couplings of novel Abelian gauge bosons with the SM Higgs boson from the one-loop kinetic mixing amplitudes. Novel contributions from gauge boson loops will be present. Finally, I will show how kinetic mixing can be tested in White Dwarf cooling and how this constrains a possible explanation of the $g-2$ anomaly in models of muon-philic dark photons.

Miércoles 4 de Septiembre de 2024 a las 14:30 horas de Chile.

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