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Probing Axion-Like Particles with Muons Across High and Low Energies

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Axion-like particles (ALPs) with lepton flavour violating (LFV) interactions are predicted within a wide range of well-motivated extensions of the Standard Model. The proposed μ TRISTAN high-energy $e\text{-}\mu^+$ and $\mu^+\mu^+$ collider provides a good opportunity to explore flavour physics in the charged lepton sector. In this talk, we discuss the potential of μ TRISTAN to probe ALP LFV couplings considering various ALP production and decay modes and compare it with multiple low-energy leptonic constraints and the expected sensitivity at experiments such as MEG-II, Mu3e, MACE.

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