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Probing Axion-Like Particles at LHC

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Axion-like particles (ALPs) are well motivated new particles that serve as candidates of beyond the Standard Model studies (BSM). In this work, we propose to probe the ALPs through p p ⟶ a j j at the Large Hadron Collider at energy 14 TeV. The considered ALP production is both t-channel and s-channels. We demonstrate that we could provide constrains the effective coupling strength between ALPs and electroweak bosons (W ±, Z, γ) in a mass range Ma well below 500 GeV. Using χ2-squared analysis both on cross-sections and also on distributions, we aim to improve on the previously calculate bounds to better constrain the coupling strengths of ALPs with electroweak bosons at LHC for channels W W, γγ, ZZ and Zγ respectively and with further decay a ⟶ γγ while considering the available couplings gaγγ , gaWW , gaγZ and gaZZ.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

MSc

Primary authors: Mr MOSALA, Karabo (University of the Witwatersrand); Dr KUMAR, Mukesh (University of the Witwatersrand); Dr SHARMA, Pramod (Indian Institute of Science Education and Research)

Presenter: Mr MOSALA, Karabo (University of the Witwatersrand)

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