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Running in the ALPs and beyond: the interplay between the SM and a singlet

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Axion-like particles or generalized pseudoscalar singlets are ubiquitous in BSM. Studying the evolution of their interactions with the SM is therefore of utmost importance.

I will discuss this interplay based on the derivation of the full set of renormalization group equations of the complete singlet EFT at one-loop accuracy, including shift-breaking and CP-violating interactions, and keeping trace of the mixing effects between the exotic and the Higgs particles. Our results are gathered in a new ALPRunner package, that we use to explore some phenomenological applications, such as EDM constraints for a generic singlet (including its mixing with the Higgs). We compare those constraints with the ones obtained in a more shift-symmetric scenario.

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