



Contribution ID: 19

Type: **Afternoon Session**

New ALP collider signals

Tuesday, April 18, 2017 5:45 PM (15 minutes)

We study the leading effective interactions between the Standard Model fields and a generic singlet CP-odd (pseudo)Goldstone boson. Two possible frameworks for electroweak symmetry breaking are considered: linear and non-linear. For the latter case, the basis of leading effective operators is determined and compared with that for the linear expansion. Associated phenomenological signals at colliders are explored for both scenarios, deriving new bounds and analyzing future prospects, including LHC and High Luminosity LHC sensitivities. Mono- Z, mono-W, W-photon plus missing energy and on-shell top final states are most promising signals expected in both frameworks. In addition, non-standard Higgs decays and mono-Higgs signatures are especially prominent and expected to be dominant in non-linear realizations.

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Session Classification: Tuesday Afternoon

Track Classification: Higgs and the Standard Model