



Contribution ID : 151

Type : **Contributed talk**

Opening the Higgs portal window

Monday, 23 May 2016 16:20 (20)

The Higgs-portal model, consisting in one singlet scalar particle coupled to the SM Higgs through renormalizable interactions is one of the most popular models for dark matter (DM). This model can easily reproduce the observed DM relic density, but it is strongly constrained by direct and indirect DM detection, as well as by collider physics. Actually, most of the parameter space is ruled-out or will be in the next future (unless there is a positive detection). We show that the simple extension of the DM sector with a second scalar singlet enables a substantial opening of the allowed window in the parameter space.

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Session Classification : Higgs 1

Track Classification : SUSY/Higgs/BSM