



Contribution ID: 70

Type: Poster

## Search for charged Higgs boson via $H^\pm W^\mp$ at the LHC.

*Friday, 8 July 2022 20:27 (3 minutes)*

A search for a charged scalars can provide clean, rare, and direct indications for New Physics (NP) beyond the standard model. Therefore, in view of the above, we investigate one of the most important channels in the 2HDM Type-I model, assuming  $h(H)$  to mimic the observed resonance  $\sim 125$  GeV; we ponder the practicality of the associated charged Higgs production through the  $pp \rightarrow H^\pm W^\mp$  channel that could have further substantial challenges at the LHC experiments. In view of that, we perform an extensive parameter scan in the lower part of the scalar mass spectrum taking into account the latest theoretical and experimental constraints. Our study in this regard shows that the signal can reach the level several fb in the reasonable parameter space notably for the  $2W + \tau\tau$  channel, which can be a clean signal for NP. Finally, we perform a detailed analysis of the significance as a function of luminosity.

### In-person participation

No

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**Session Classification:** Poster Session

**Track Classification:** Beyond the Standard Model