



Contribution ID: 143

Type: **Parallel talks**

Direct Bounds on Left-Right Gauge Boson Masses at LHC Run 2

Monday 17 July 2023 16:00 (20 minutes)

While the third run of the Large Hadron Collider (LHC) is ongoing, the model that extends the Standard Model remains so far unknown. Left-Right Models (LRMs) introduce a new gauge sector, and can restore parity symmetry at high enough energies. If LRMs are indeed realized in nature, the mediators of the new weak force can be searched for in colliders via their direct production. We recast existing experimental bounds from LHC Run 2 on the heavy LRM gauge boson masses. As a novelty, we discuss the effect of the LRM scalar content on the total width of the new gauge bosons, obtaining model-independent bounds within the specific realizations of the LRM scalar sectors analysed here. These bounds avoid the need to detail the spectrum of the scalar sector, and apply in the general case where no discrete symmetry is enforced. Moreover, we emphasize the effect of the structure of the quark right-handed mixing matrix on the charged LRM gauge boson production at LHC.

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Session Classification: Alternative theories to SUSY

Track Classification: Alternative theories to SUSY