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A Simplified Model of Heavy Vector Singlets at the LHC and Future Colliders

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Novel heavy vector resonances are a common prediction of theories beyond the Standard Model, and the framework of simplified models provides a phenomenological bridge between these theories and the experimental limits obtained at colliders. In this talk I will introduce a simplified model for two colorless heavy vector resonances in the singlet representation of $SU(2)_L$, with zero and unit hypercharge, and discuss their phenomenology at proton colliders. I describe the semi-analytic production and decay of the charged and neutral vectors under the narrow width approximation, and show current LHC constraints, as well as sensitivity projections for the HL-LHC, HE-LHC, SPPC, and FCC-hh. The use of this simplified model is shown by matching onto three explicit models: one weakly coupled abelian and one weakly coupled non-abelian extension of the Standard Model gauge group, and a strongly coupled minimal composite Higgs model. Limits are given on the coupling and the physical resonance mass under these models, and I will use these to motivate future efforts at colliders of higher energy and luminosity.

Mini Symposia (Invited Talks Only)

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