

@students: From ASP2010 to probing longitudinal VBS at a future hadron collider

Saturday, 3 December 2022 11:00 (30 minutes)

The Vector Boson Scattering (VBS) process of massive vector bosons is predicted by the Standard Model (SM) as being sensitive to ElectroWeak Symmetry Breaking (EWSB). Prior to EWSB, all vector bosons are massless and only have transverse polarization states. However, after EWSB, W and Z bosons become massive and gain an extra polarization state - the longitudinal polarization, whereas photons and gluons remain massless. In the absence of the SM Higgs boson, cross-sections of the scattering of longitudinal components would keep increasing as a function of energy. VBS is sensitive to interactions between the longitudinal components of massive vector bosons, hence making it a good platform for the study of EWSB. There have been various studies of prospects for the cross-section measurement of longitudinally polarised vector bosons at the high luminosity Large Hadron Collider (LHC) and also at a future high-energy muon collider.

Accompanied by a very short tale of my journey from attending ASP 2010 to date, this talk will present a study on the sensitivity to longitudinal VBS at a future 27 TeV, 50 TeV and 100 TeV $\mu\mu$ collider in the same sign W VBS process.

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