

Abstract Submitted  
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**Study of Longitudinally Polarized Vector Boson Scattering Fractions in Semileptonic VBS Decays at the HL-LHC** JENNIFER ROLOFF, MARC-ANDRE PLEIER, Brookhaven National Laboratory, LAILIN XU, University of Science and Technology of China, VIVIANA CAVALIERE, Brookhaven National Laboratory — Longitudinal vector boson scattering (VBS) provides an important probe of electroweak symmetry breaking, bringing sensitivity to physics beyond the Standard Model as well as constraining properties of the Higgs boson. Despite its importance, it is challenging to study, due to the low cross section and difficulties in distinguishing between the different polarization states. While there have been some studies of the prospects for measuring VBS of longitudinally polarized W bosons ( $W_L W_L$ ) production in the fully leptonic final state, little has been said about the semi-leptonic final state. While the backgrounds are larger in the semi-leptonic case, the signal cross section is also higher due to the enhanced branching fraction. It also provides different handles for determining the polarization through full reconstruction of the event kinematics using the W boson mass constraint and through the use of jet substructure. This talk will discuss the prospects for the search of semi-leptonic VBS production of  $W_L W_L$  at the HL-LHC.

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