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First measurements of Vector Boson Scattering process with Run-3 data collected by the CMS experiment at LHC

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In this seminar, I will present the analysis of same-sign WW and WZ boson production in association with two jets in proton-proton collisions at a centre-of-mass energy of $\sqrt{s}$ = 13.6 TeV. The analysis uses data collected by the CMS detector during 2022–2026, corresponding to an integrated luminosity of 308 fb−1. The measurements are performed in the leptonic decay channels $W^{\pm}Z \rightarrow \ell^{\pm}\nu\ell'^{+}\ell'^{-}$ and $W^{\pm}W^{\pm} \rightarrow \ell^{\pm}\nu\ell'^{\pm}\nu$, where $\ell, \ell' = e, \mu$. Both inclusive and differential fiducial cross sections are measured as a function of several kinematic observables. In addition, I will discuss the search for possible effects of physics beyond the Standard Model through nomalous quartic gauge couplings (aQGCs), interpreted within the framework of the Standard Model Effective Field Theory (SMEFT) using dimension-8 oper-
ators. The sensitivity of different kinematic observables to these operators is investigated to identify the most sensitive variables and derive constraints on the corresponding Wilson coefficients. Finally, the dependence of these constraints on the EFT cutoff scale Λ is studied using the clipping technique.

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