



CMS PPS tracker & *WW/ZZ* central exclusive production

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Central exclusive production of WW/ZZ

- Central exclusive production: $pp \rightarrow p + X + p$
 - Protons interact, produce something, survive!
- Study X = WW or ZZ
 - Loads of possible final states
- Why? Physics goals:
 - Search for non-resonant enhancements over SM in high mass tails (AQGC/EFT)
 - Constrain models predicting resonance production
- Can we catch outgoing protons?



 \rightarrow BSM!





Outgoing protons and where to find them: CMS Precision Proton Spectrometer



CMS

Walk about 200 m away from it, in the tunnel....



Precision Proton Spectrometer







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Precision Proton Spectrometer





CMS Precision Proton Spectrometer



PPS works as a magnetic spectrometer:

- Outgoing protons have lower energies
 - 1. Magnets bend their trajectory
 - 2. Given their offset from the beam, one knows their energy



Complete measurement of the final state!





The PPS tracking detectors



Need to measure proton tracks 3D silicon detector technology used:

- Need to be very radiation hard (5·10¹⁵ protons/cm² in Run2)
- Irradiation highly non-uniform!
- Spatial resolution ${\sim}10~\mu\text{m}$



PPS collected ~100 fb⁻¹ in LHC Run2 Detectors getting ready for Run3 in 2022!



Thank you!