

# Status ideas for very forward physics measurements in ALICE 3

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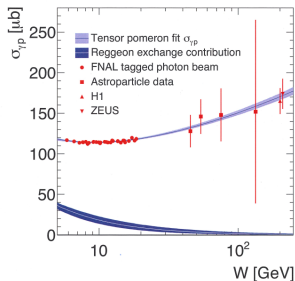
diff PAG meeting, sept 9, 2021

# Cross section $\gamma p$ in pA collisions

## ■ ALICE 3 workshop, Otto Nachtmann, slide 6,7

- photo production and low x DIS, Britzger, Ewerz, Glazov, O.N., Schmitt, PRD 100 (2019) 114007.

In this paper we could show that a vector pomeron decouples completely in the total photoabsorption cross section and in the structure functions of DIS. In contrast, with the tensor pomeron we get excellent fits. I show this for the case of  $\sigma_{tot}(\gamma p)$  for real photons.



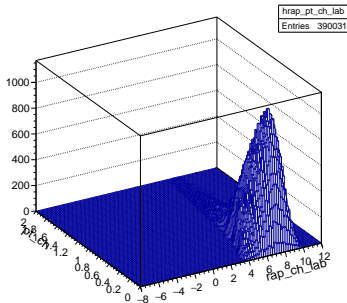
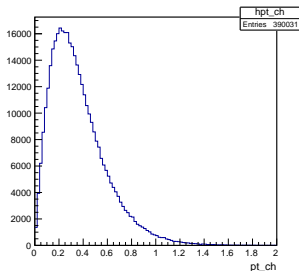
We hope that  
Alice 3  
will be able  
to measure  
 $\sigma_{\gamma p}$  at even  
higher  $W$   
in ultraperipheral  
 $A p$  collisions.

## Cross section $\gamma p$

- How many  $\gamma p$  events in pPb event sample?
- Event characteristics of  $\gamma p$  reactions?
- charged particle multiplicity?
- transverse momentum distribution?
- rapidity distribution?
- take pPb collisions, Pb beam as source of photons
- PHOJET generator for signal
- PYTHIA for pPb collisions for generating background

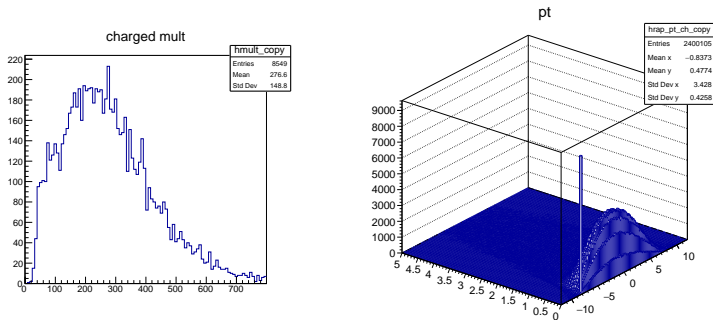
# PHOJET $\gamma p$ events

- pPb at  $\sqrt{s} = 5.02$  TeV:  $P_{prot} = 4$  TeV,  $P_{Pb} = -1.577$  TeV
- $W =$  energy of  $\gamma p$  system,  $W = 6$  GeV



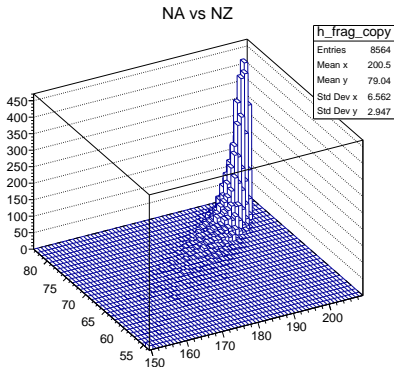
# PYTHIA $pPb$ events

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# PYTHIA $pPb$ events

- $pPb$  at  $\sqrt{s} = 5.02$  TeV:  $P_{prot} = 4$  TeV,  $P_{Pb} = -1.577$  TeV
- nuclear fragments of Pb at negative rapidity  $y \sim -8$



## compare signal and background

- pPb at  $\sqrt{s} = 5.02$  TeV:  $P_{prot} = 4$  TeV,  $P_{Pb} = -1.577$  TeV
- $W =$  energy of  $\gamma p$  system,  $W = 6$  GeV

