

ATLAS ZDC 2022

H4 test beam program

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On behalf of the ATLAS ZDC team

Goals

- Calibrate zero-degree calorimeter modules using electrons and protons prior to the LHCf & HI runs
 - 4 modules each in 2 calorimeters (8 total)
 - ➔ calibrated individually
 - quartz radiators refurbished in 2021
 - ➔ initial validation in 2021 test beam and Pilot beams
 - will be read out using new FEE electronics
- Test & calibrate new “reaction-plane detector” (RPD) using electrons
 - two such detectors w/ 16 channels each
- Test full calorimeter geometry w/ protons
 - 4 modules + RPD

Beams

- Primary calibrations need electron beams:
 - 250 GeV, purity: $>\sim 50\%$ (expect slightly less), rate: 1 kHz
- If a lower energy electron WP is possible (150 GeV), we might use it to check ZDC module linearity
 - purity: best possible, can accommodate anything above 25%
 - ➔ Not essential, but if possible we would include in our plan
- For ZDC modules and full calorimeter, we would calibrate hadronic response w/ protons @ 300 GeV
 - purity: $> 80\%$, rate: up to 10 kHz
- Allocation:
 - 4.5 days electrons, 1.5 days protons

Infrastructure, other needs

- Infrastructure
 - No gas requirements
 - Will need Goliath table
 - Request separate XSCA table for trigger counters
- Rigging required for ZDC modules
 - initial installation, configuration for single-module testing
 - re-arranging for full-calorimeter testing
 - de-installation

1



e- @ 250, 150 GeV
p @ 300 GeV

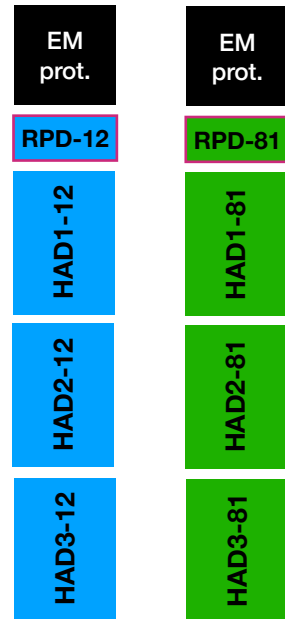
ZDC beam time



2



e- @ 250 GeV

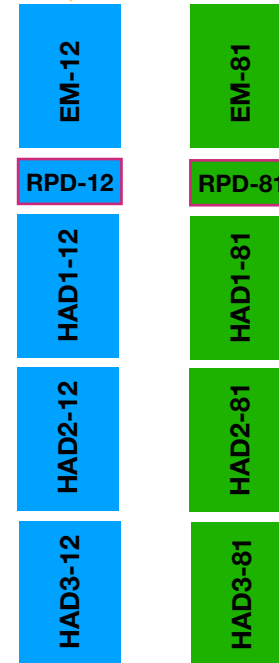


RPD beam time

3



p @ 300 GeV



ZDC+RPD beam time