

Student Operations Shift Report: CMS Data Express


Describe the tests to determine if the CMS detector is calibrated.

Reason this is important to CMS operation:

Physics principles in detection and measurement of muons:

Reasoning to support that the tests described above will determine if the CMS detector is calibrated.:


Claim:



Evaluate the test results to determine if the CMS detector is calibrated.

Questions to consider: What is the mass of the Z boson according to your measurements? What is the ratio of W⁺ to W⁻ particles? Are these consistent with the known Z mass? With the design expectation for W⁺/W⁻?

Evidence:



Use your number of W⁺ and W⁻ or use your mass plot. Attach any plots or calculations.

Questions to consider: What data supports the claim? How is this data presented?

Reasoning:



Justify how and why the evidence backs up the claim. Use scientific principles to explain *why* you got these data. Use and explain relevant scientific terms.

Questions to consider: Why does the data compel this claim? Is anything left out?

Sources of Uncertainty in Measurement:



How much would a change of a few W^+ results for W^- results (or vice versa) change your value for W^+/W^- ? How wide is your Z mass peak compared to its height?

Question to consider: Why and to what extent can we trust your results?

Practical Applications:



What is the value of what you learned?

Questions to consider: How might this information be useful to the CMS collaboration in understanding the detector?