Using SSDs for the WCD calibration?

...or a better determination of the calibration constants

Ioana C. Mariș, Orazio Zapparrata

[a]Universite Libre de Bruxelles

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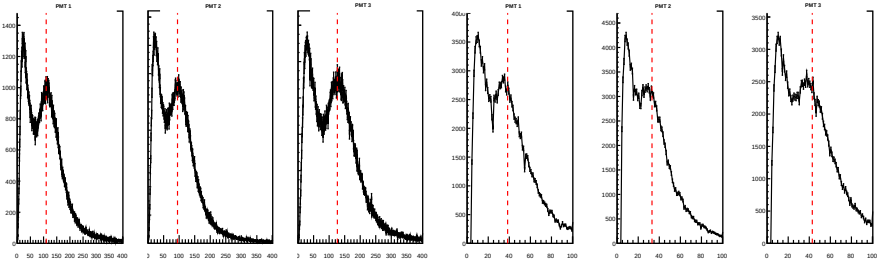
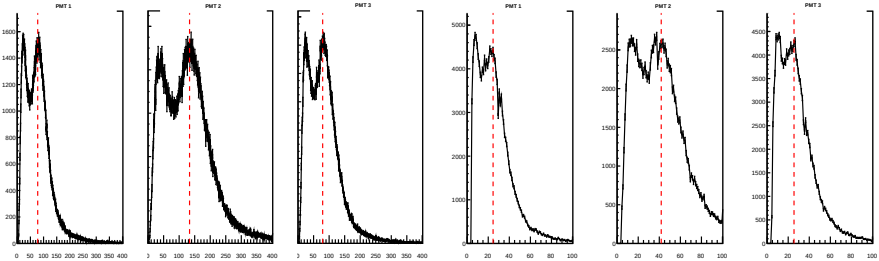
- Simulation of the calibration histograms
- Based on previous Offline configurations, changing liner reflectivity, etc

Example of calibration histos

Kosak

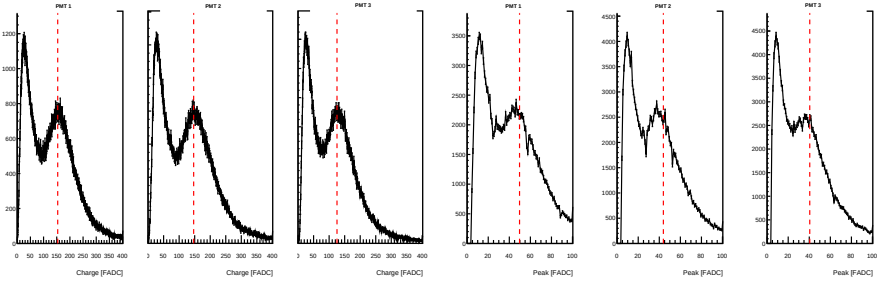


Roma Joyce

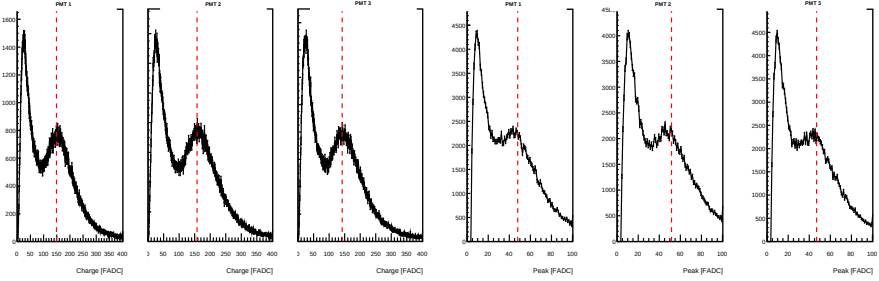


Example of calibration histos

Valerita

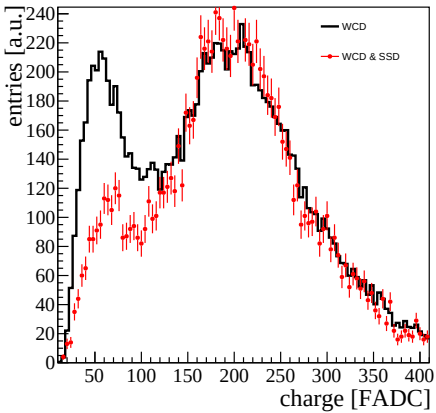


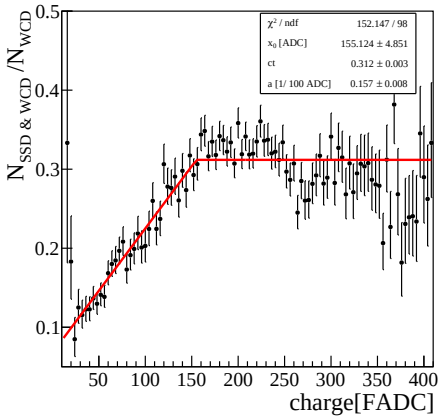
Denisa Maria



Coincidence calibration histos reduce as expected the photon contribution

Liner reflectivity @ nominal value, 0.94





→ Ratio of the histograms sensitive to the electromagnetic component

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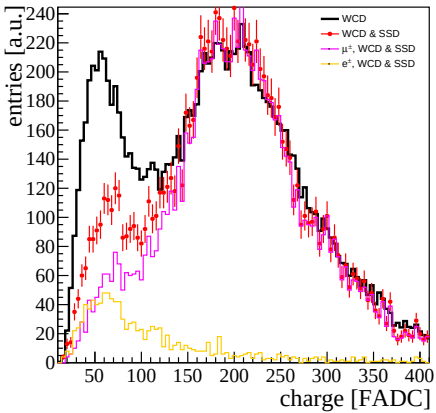
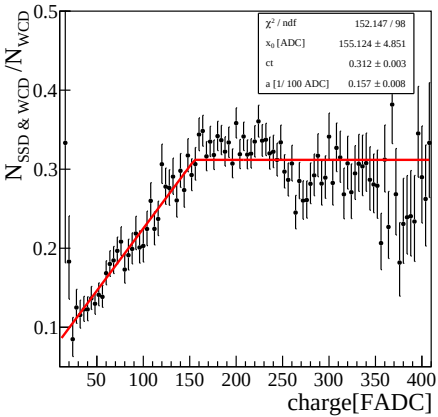
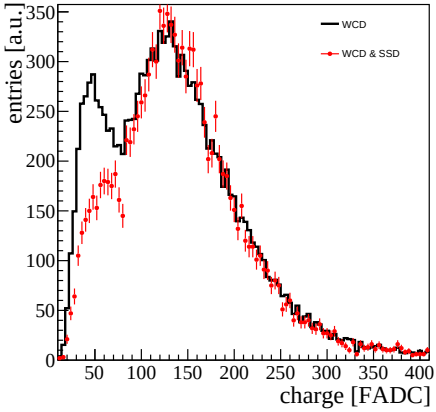


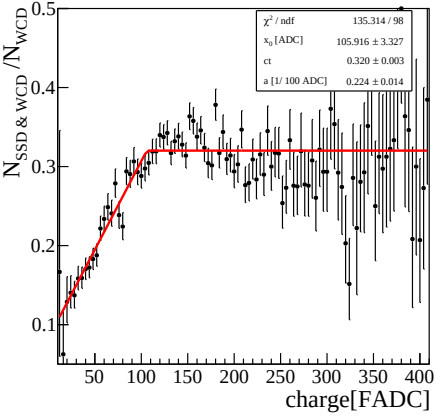


→ Ratio of the histograms sensitive to the electromagnetic component

Changing the liner reflectivity

Liner reflectivity @ 0.9

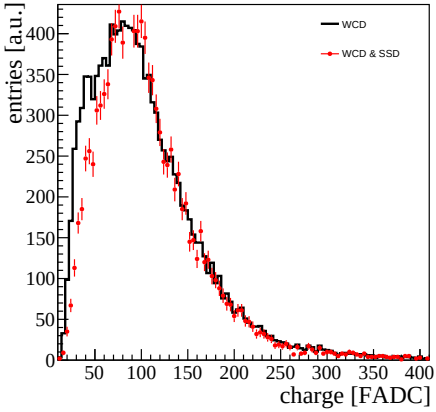


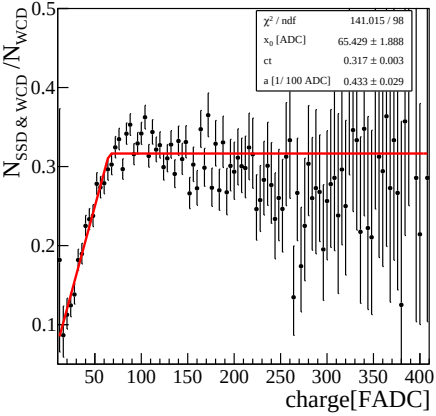


→ A smaller peak x-value can be easier reconstructed (might solve the *problematic* stations)

Changing the liner reflectivity

Liner reflectivity @ 0.85

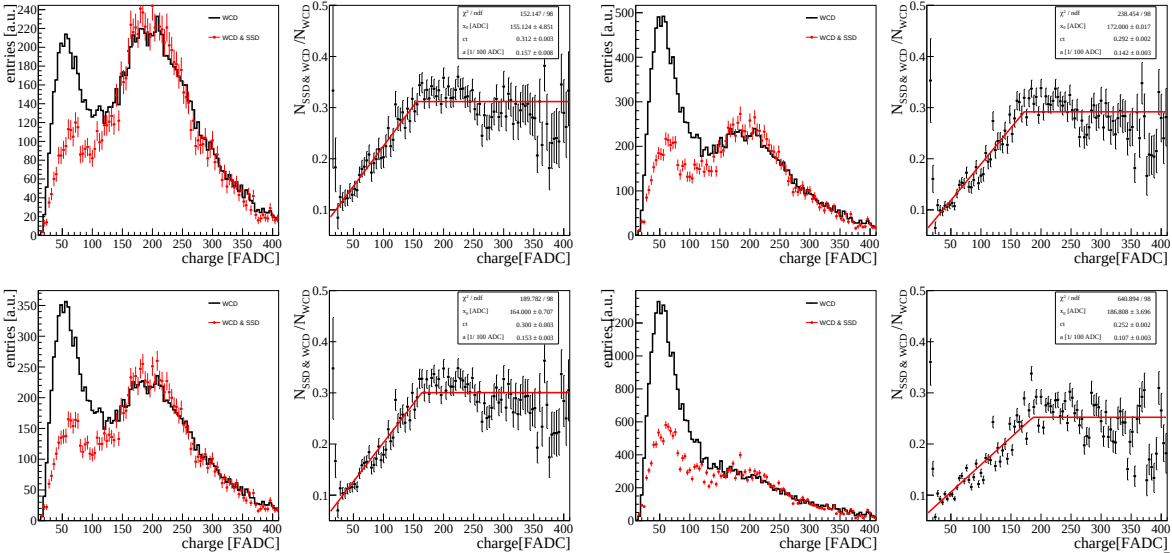




→ A smaller peak x-value can be easier reconstructed (might solve the *problematic* stations)

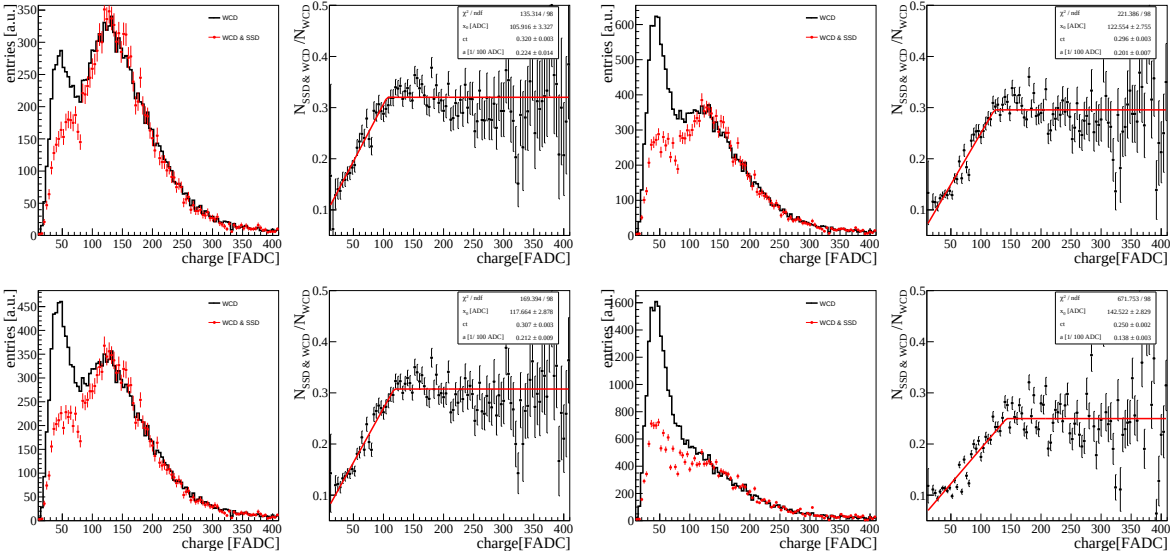
E.m. multiplied by a factor 1, 2, 3, 10 (a cut @20MeV is applied)

Liner reflectivity @ 0.94



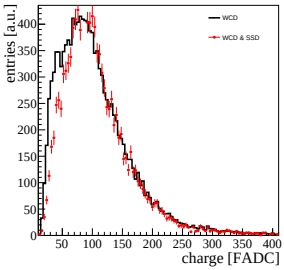
E.m. multiplied by a factor 1, 2, 3, 10 (a cut @20MeV is applied)

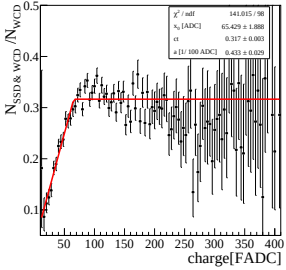
Liner reflectivity @ 0.90

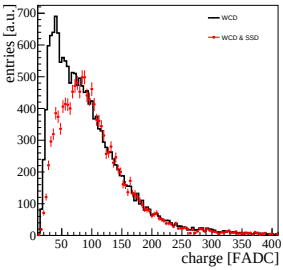


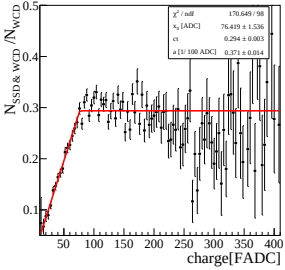
E.m. multiplied by a factor 1, 2, 3, 10 (a cut @20MeV is applied)

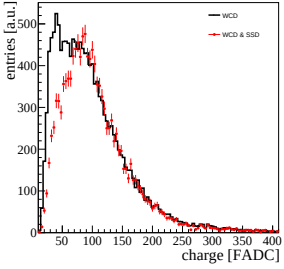
Liner reflectivity @ 0.85

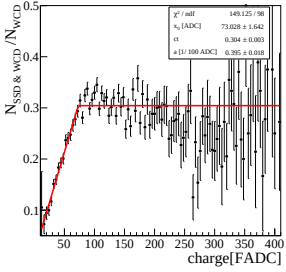


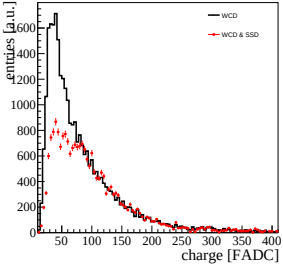


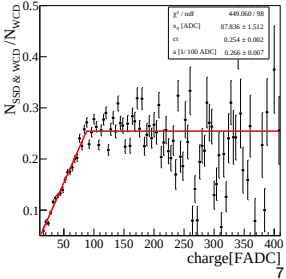




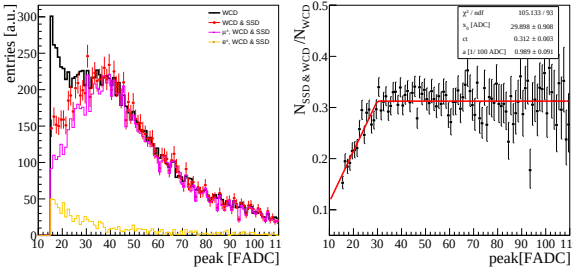


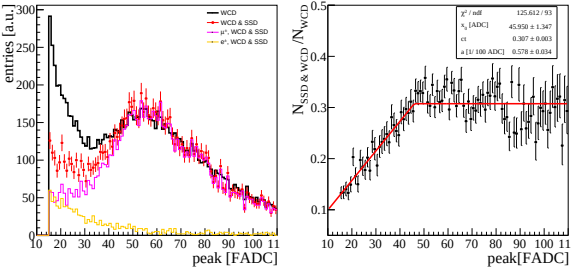


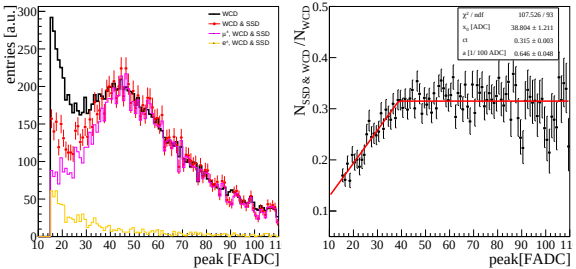




The peak for different reflectivities







Enable the reconstruction of the peak

Conclusions

- Storing the coincidence SSD-WCD calibration hiostograms can improve the determination of the muon charge
- The muon peak value (not only charge) can be easily reconstructed
- Ratio between histos might give further insights in e.m. calibration

Things that might make the life complicated (or not):

- Assymmetries between the 3 PMTs (a plus or a minus)?
- Threshold effects (?)

Implement a test on a local station software and check the information gain with data.