

Source Calibration of HO Testbeam modules

Mandakini Patil

B. Satyanarayana

Harinder Singh

Sudeshna Banerjee

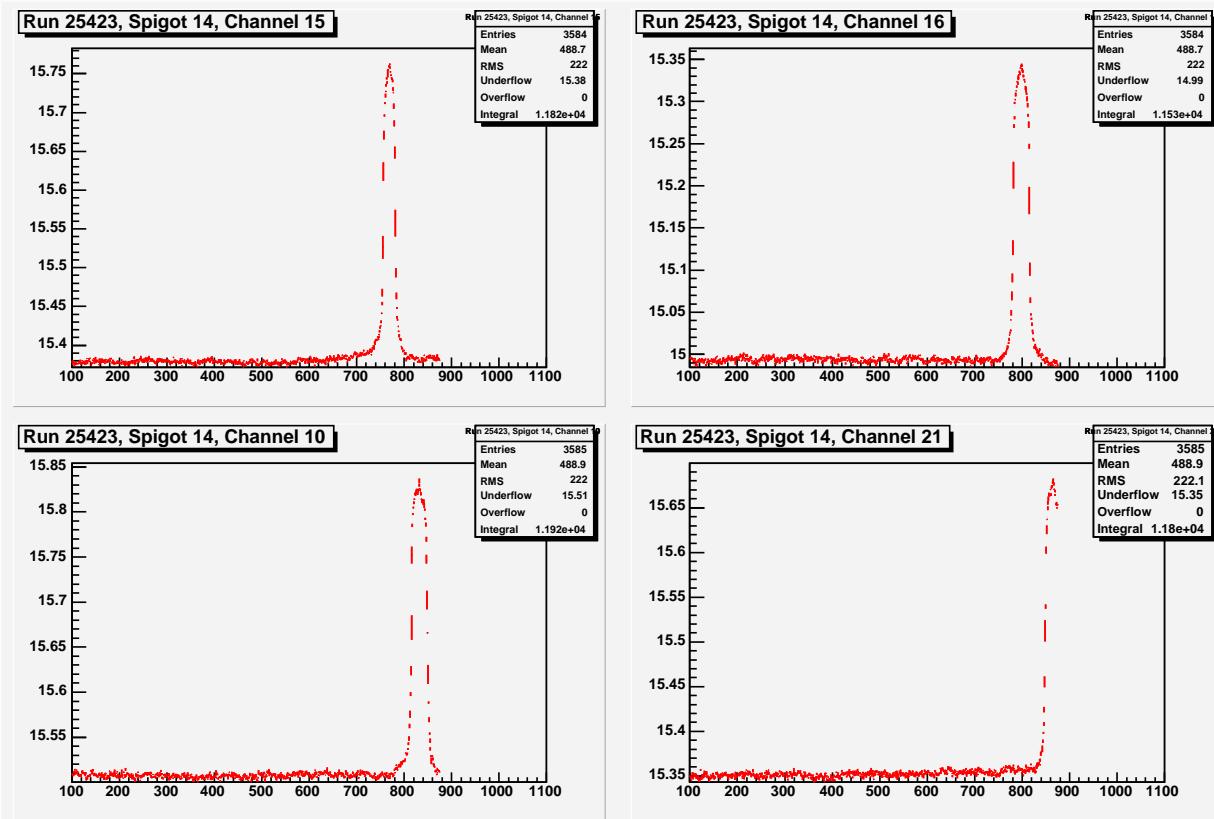
Tata Institute, Mumbai, February 2005

- HO tiles were exposed to the radioactive source and runs were taken with HPD high voltage at 8 kV and 10 kV in January 2005
- Data with muons was taken during 2004 Testbeam run with HPD high voltage at 10 kV

HO-CMSHCAL

Signal for 4 η tiles of Ring 0 (Layer 0) for source run with HPD voltage at 8 kV

($\eta = 1$ to $\eta = 4$, $\phi = 3$)

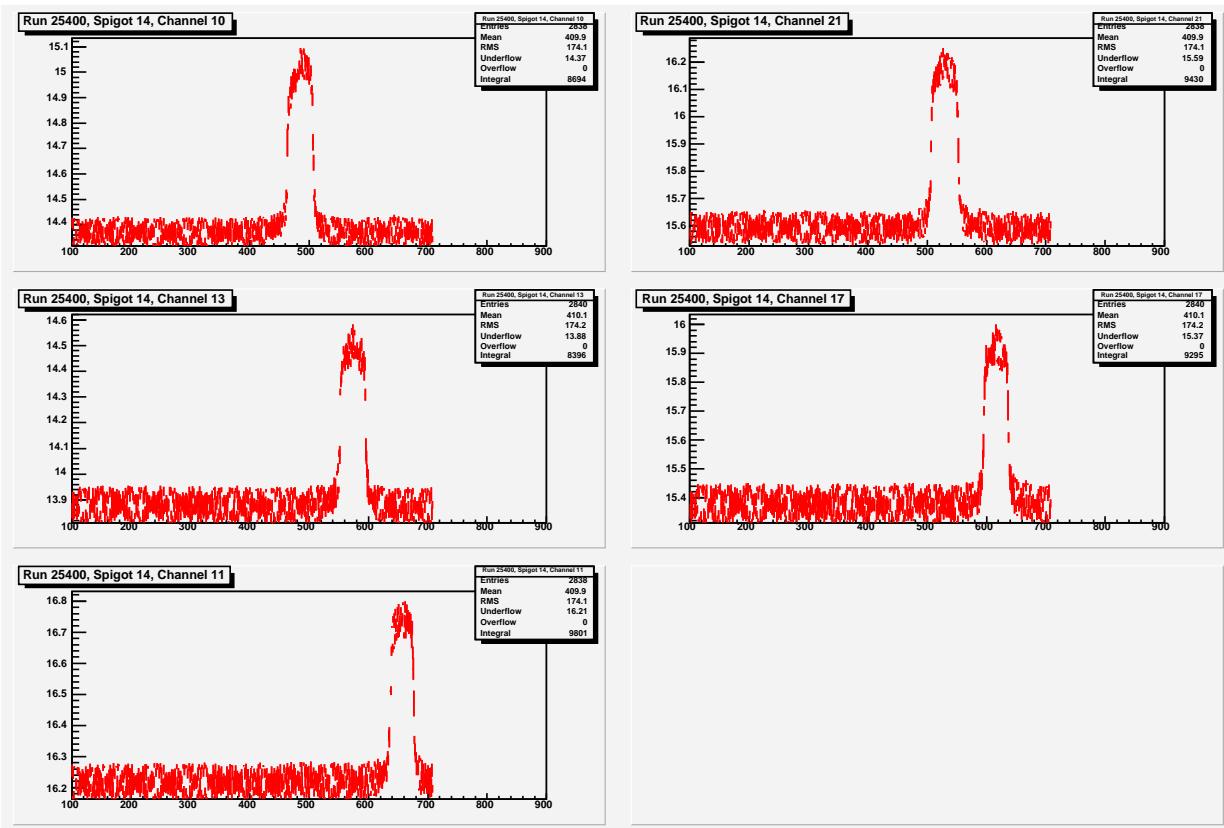


Magnitude of signal = Peak height - Base height

HO-CMSHCAL

Signal for 5 eta tiles of Ring 1 for source run with HPD voltage at 10 kV

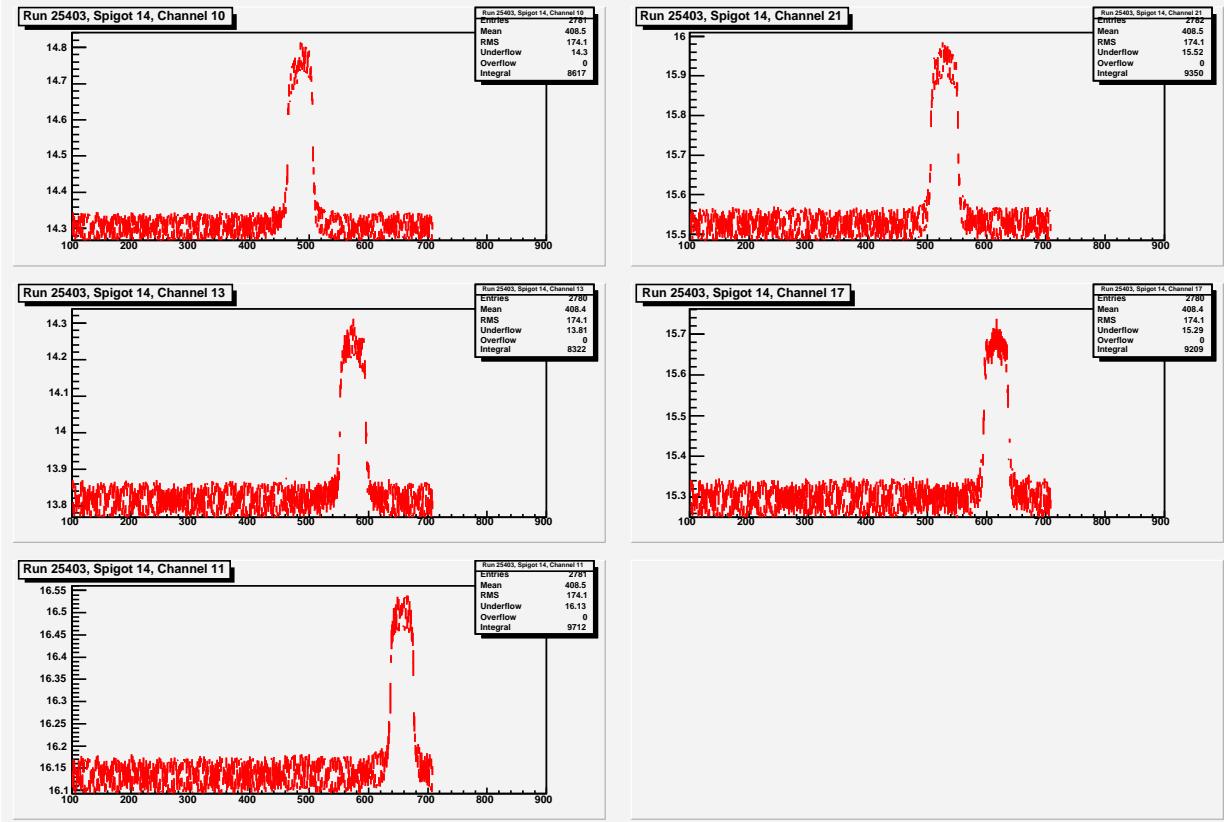
$(\eta = 10 \text{ to } \eta = 6, \phi = 3)$



Magnitude of signal = Peak height - Base height

HO-CMSHCAL

Signal for 5 eta tiles of Ring 1 for source run with HPD voltage at 8 kV ($\eta = 10$ to $\eta = 6$, $\phi = 3$)



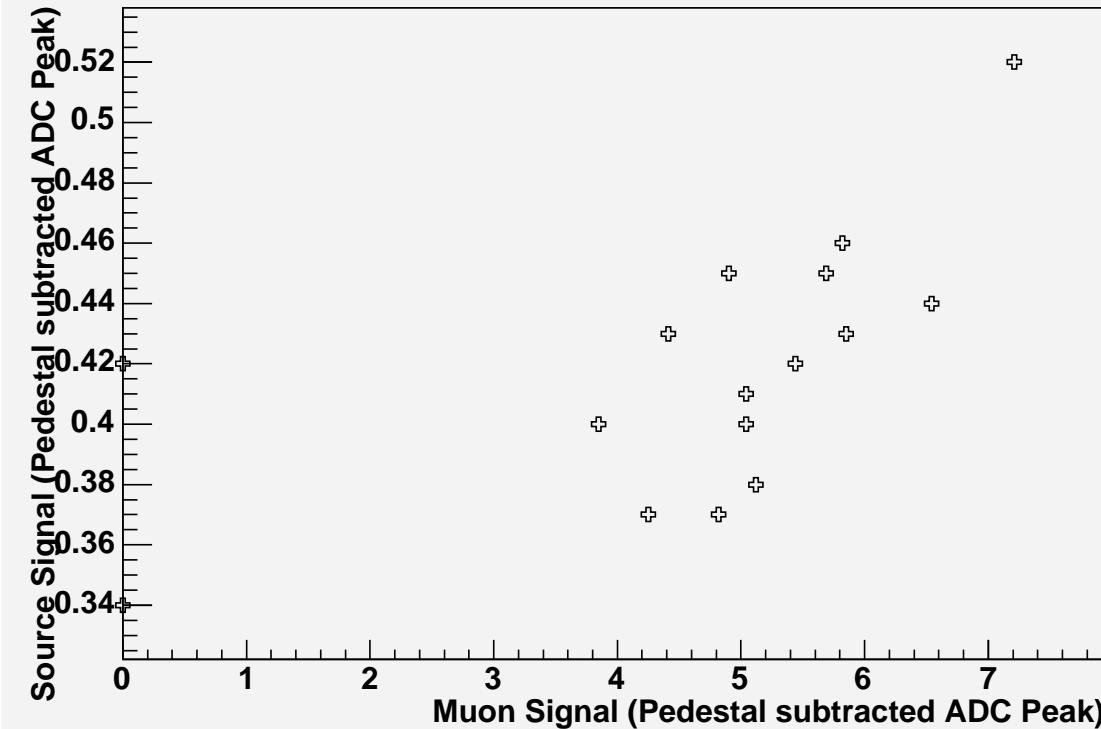
Magnitude of signal = Peak height - Base height
Signal increases by $\sim 30\%$ for increase in HPD voltage from 8 kV to 10 kV (compare with previous plot). This is similar to what was seen for HO tiles in Testbeam 2002 with muons.

HO-CMSHCAL

Ring 0 - Radioactive source vs. muons

$$\eta = 0 \text{ to } 4, \phi = 2 \text{ to } 6$$

Ring 0, eta = 1 to 4, phi = 2 to 6, Muon vs. Source Calibration



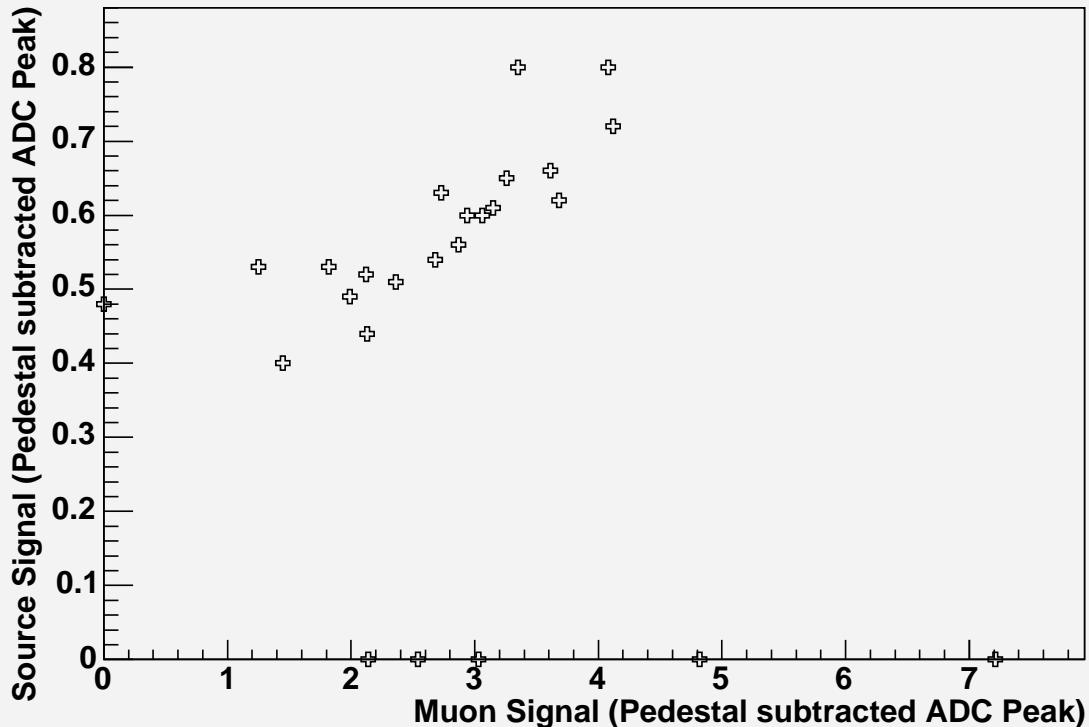
There is a clear correspondence between the two signals.

HO-CMSHCAL

Ring 1 - Radioactive source vs. muons

$$\eta = 6 \text{ to } 10, \phi = 2 \text{ to } 6$$

Ring 1, eta = 6 to 10, phi = 2 to 6, Muon vs. Source Calibration

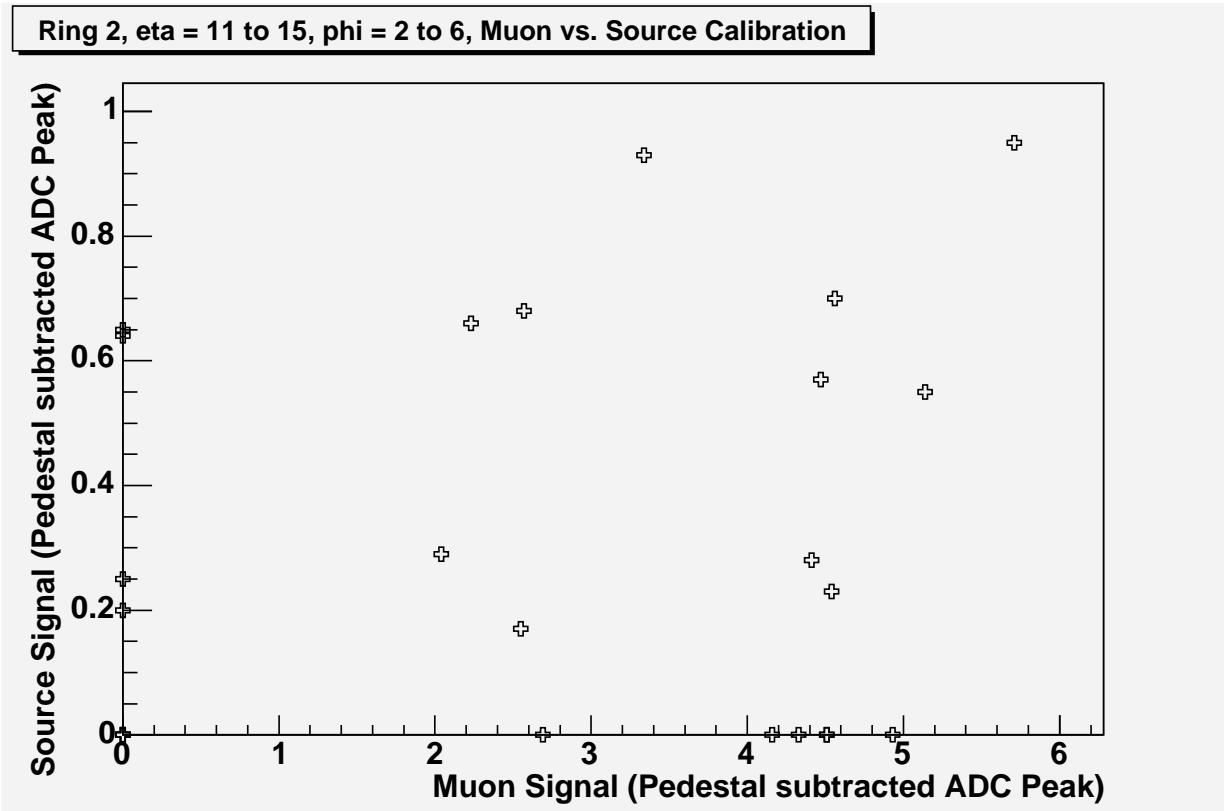


There is a clear correspondence between the two signals.

HO-CMSHCAL

Ring 2 - Radioactive source vs. muons

$$\eta = 11 \text{ to } 15, \phi = 2 \text{ to } 6$$



The correspondence is not as clear because of many missing runs, both in muon as well as source data.

Conclusion

Muon calibration matches well with calibration obtained with radioactive source for the HO tiles.

Source Calibration can be used for HO tiles for energy calculation with testbeam data.

HO-CMSHCAL