

# Manual for Matthieu Bethermin's software for pulser TDC calibration

## 1) Calibration of TAC566&ADC144

The data are in in /net/komodo/u4/bether/Calibration/Calibration\_pulser\_test. You need to launch root this directory.

The file used for analysis is run198.dat. A data file of the same type need to be in this directory for analysis.

For launching the peak detection program, enter '.x read\_run.c' in ROOT. Tape run198 or an other run when the program ask for a run name.

For the linear fit of peak position, enter '.x read\_fit.c'. Next for residuals plot, enter '.x read\_res.c'.

Postscript results files are generated by these programs. directly in the directory.

## 2) Generating TDC histogram from raw data

For this task, I use Jose's macros and 2 new macro. All these macro are in /net/komodo/u4/bether/Calibration/Macro\_and\_Output/SOFTWARE. You need to load Load.C on ROOT in order to use these macros.

For generating, a macro, use on ROOT the command `mat_loadtdc(chain of run, first event, last event, first slot, last slot, first pad, last pad, first hour, last hour)`. The chain of run could be `makedaychain(daynuber)` where day 1 is the first of May. The macro generate a `run_save.root` file in the work directory. In general, I have created a folder in Macro\_and output for each `run_save.root` to have no problem.

If you need to add run in `makedaychain`, modify SOFTWARE/MatMacro/makedaychain.C

## 3) Analysis of one run or one chain of run198

Open ROOT in the same directory than the `run_save.root` file which correspond to the studied run or chain of run with Load.C. I have programmed lot of uncompiled macro to study a run.

“.x ../Uncompiled\_Macro/Onerun/AllPadPlot.C(first slot, last slot, first pad, last pad, tdcmin, tdcmax)”: Plot the histogram in the chosen window.

“.x ../Uncompiled\_Macro/Onerun/AllPadPeaksDet.C(first slot, last slot, first pad, last pad)” : This program find the pulser peaks, fit it and plot the result in a txt file. There is sometimes a segmentation fault problem at the end of the program, but the txt and ps file are generated correctly.

“.x ../Uncompiles\_Macro/OnePad/AutoLaunchAnalysis.C” : Launch the fir of the peaks found for all pad. There is 3 different fit made in this macro (mean of pspc calculated between two points, linear and quadratic fit). It generate a map of the pspc, offset and

chisquare for all the pad for linear fit.

There is lot of other program in this directory, it's easy to open it and read the first line to know arguments.

I have generate twelve folder (0-2,2-4,4-6...) containing data what come from where I have use AutoLaunchAnalysis. I have a program wich create the graph of pspc and offset evolution. You need to launch it in

DayEvolution folder. Use:

```
“.x ../Uncompiled_Macro/Compare_run/Day_offset.C”
```

```
“.x ../Uncompiled_Macro/Compare_run/Day_pspc.C(fitchoice)” (fit choice =1 for using constant fit data and 2 for linear fit data).
```

#### 4) One pad evolution

The program linker with Pad evolution study are in /net/kifaru/u4/bether. Creat one folder for one slot with the name slotpadjevolution with i and j respectively the slot and pad reference. Next, launch ROOT with ../SOFTWARE/Load.C in the good folder. And launch the prevous macro:

```
“.x ../Uncompiled_Macro/PadEvolution/GenerateRootFiles.C(slot, pad, start day, end day)”
```

: generate one root file in one folder for each one hour interval. The start day and end day is the day number after the first of May.

```
“.x ../Uncompiled_Macro/PadEvolution/OnePadPeaksDetEvo.C(slot, pad startday, endday, Npeak, threshold, prefit range)”
```

: fit the peak for all one hour range and generate a text results file. threshold and prefit range are option. For prefit range use about 30 counts.

```
“.x ../Uncompiled_Macro/PadEvolution/LinFit_OnePad.C(slot,pad,start day, end day, Npeak)”
```

: Fit the peak position in order to have ps/count and offset value for all hour range.

```
“.x ../Uncompiled_Macro/PadEvolution/Pad_Evo.C(slot,pad,start day, end day)”
```

: Plot the evolution of ps/cont and offset on the selected days.

If you wnt to compare the results of several pad, use “.x ../Uncompiled\_Macro/ComparePad/ComparePad.C(slot, pad, slot2, pad2, startd day, end day)” in ComparePadOutput directory.

For the Marker study, I use three programs:

```
“.x ../Uncompiled_Macro/PadEvolution/GenerateRootFiles.C(slot, pad, start day, end day)”
```

```
“.x ../Uncompiled_Macro/Marker Study/MarkerPosDet.C(slot,pad,start day, end day)”
```

```
“.x ../Uncompiled_Macro/Marker Study/MarkerPosEvo.C(slot,pad,Npts)”
```

Good luck for the guy which will try to use my bad programmed macro!