ECAL/HCAL Time Settings

Tutorial

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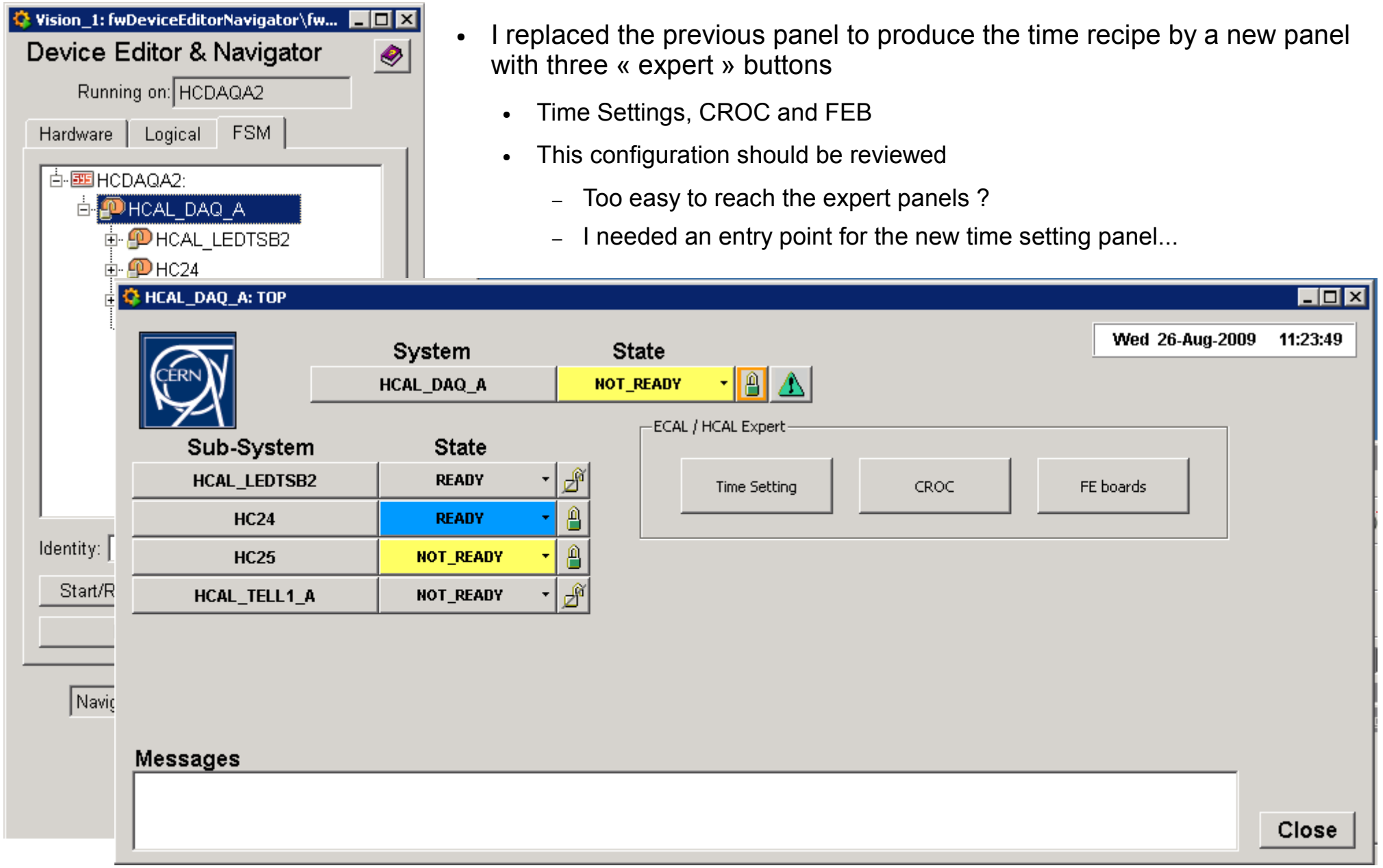
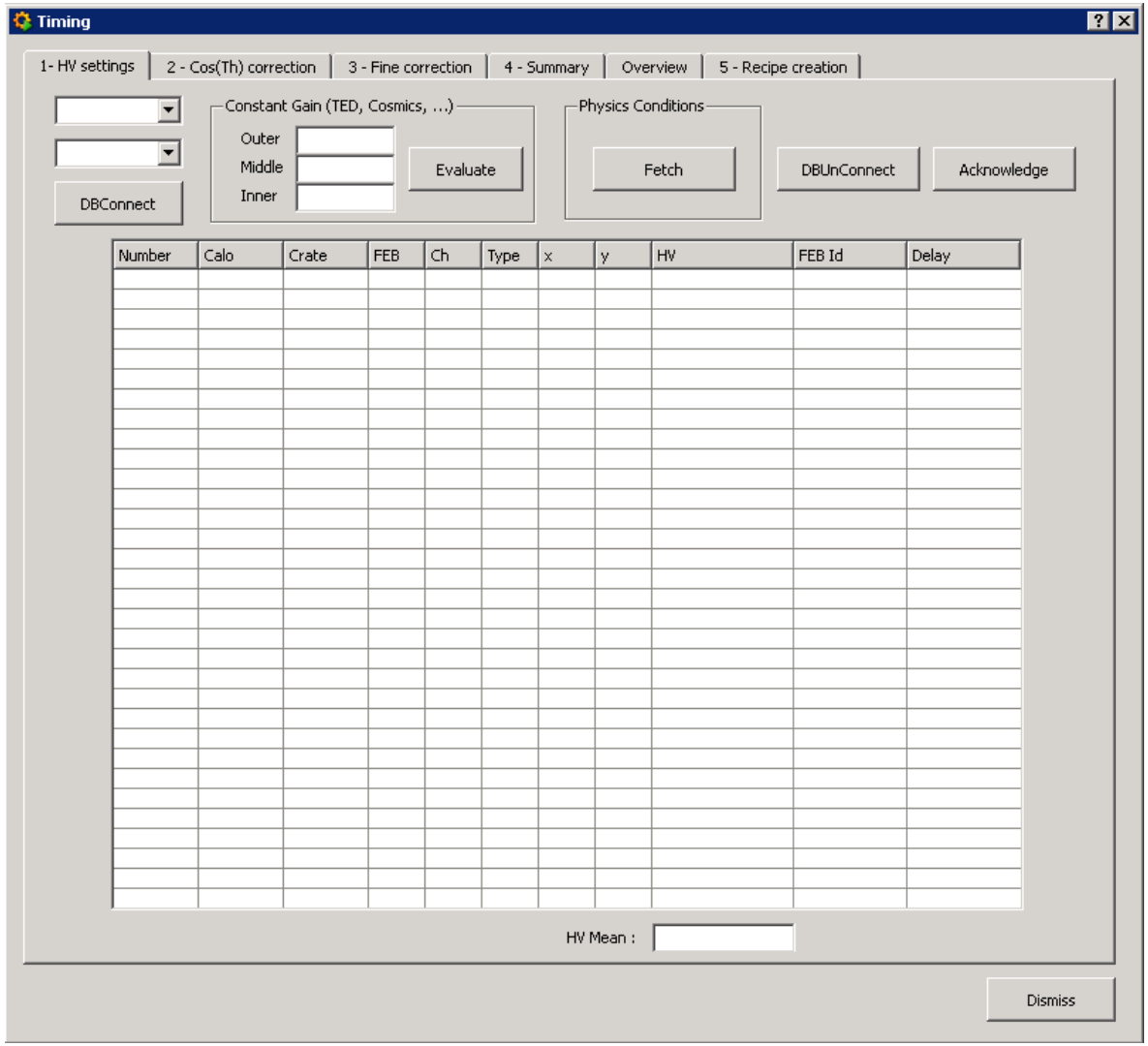
The « Expert » panels

- I replaced the previous panel to produce the time recipe by a new panel with three « expert » buttons
  - Time Settings, CROC and FEB
  - This configuration should be reviewed
    - Too easy to reach the expert panels ?
    - I needed an entry point for the new time setting panel...



The Time Setting panel



- Purpose is to produce the time setting correction in a transparent way from the calo database information
  - Cell positions
  - Cell connections to the FEB
  - Cell HV(gain)
- Several tabs to
  - Fetch cell data from the CaloDB
    - Evaluate HV settings
  - Perform cos(θ) correction
  - Add fine tunings
  - Sum-up all the corrections
    - Add a global offset
    - Sum-up corrections
    - Overview (plots)
  - Create final recipes

Getting the Information from the DB

(1) Connect to the DB

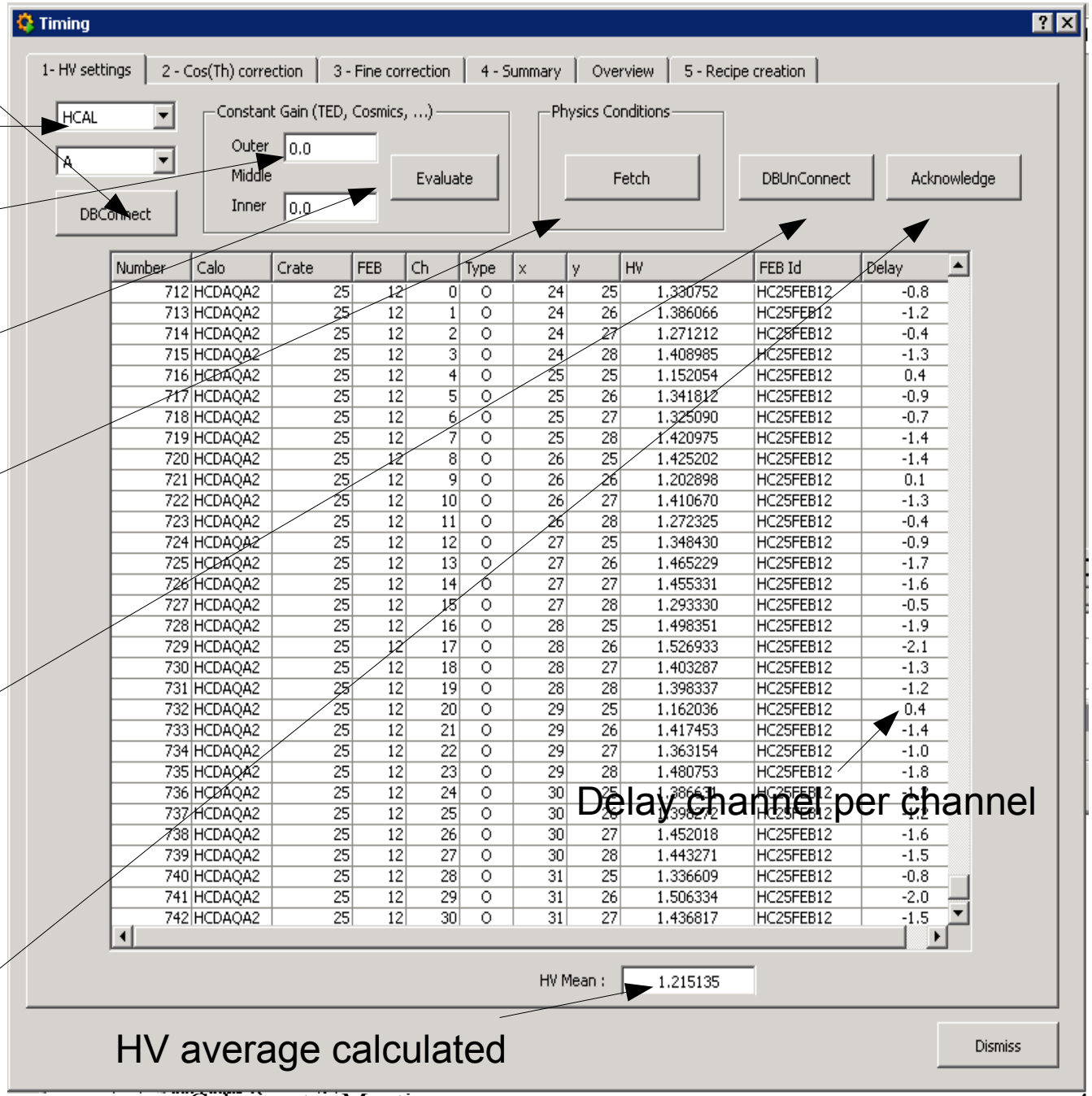
(2) Select the detectors you may get data for (FSM Node) (« middle » for ECAL only)

(3A) Fill in the Gains required (Cosmics, TED, ...) and evaluate the HV from the DB data → table gets filled

Or (3B) Get the data for physics conditions from the DB → table gets filled

Un-connecting from the database is done automatically when closing the panel (no arm in doing it twice!)

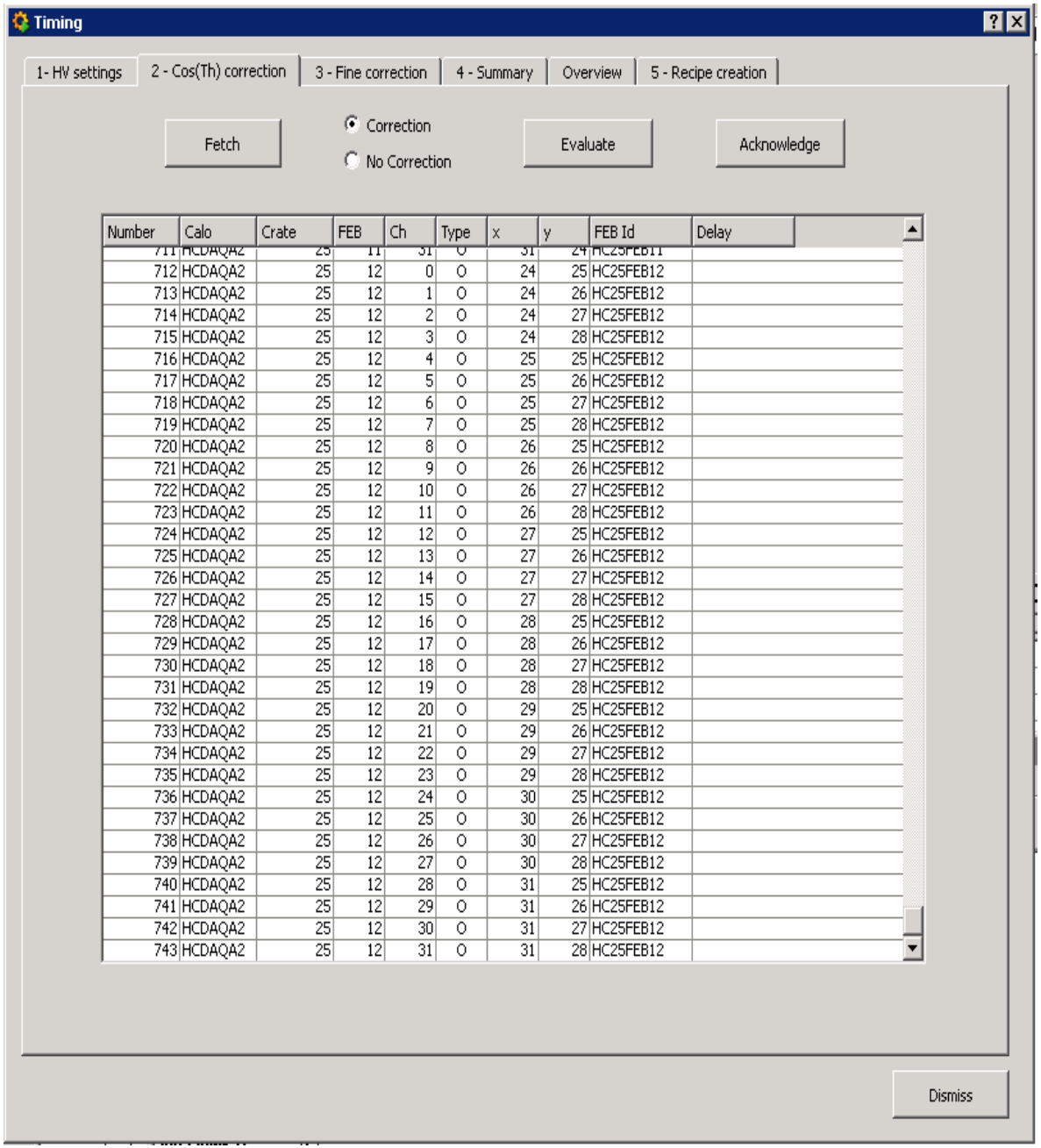
(4) You HAVE to acknowledge the table before going to the next tab



Delay channel per channel

HV average calculated

Cos (θ) correction

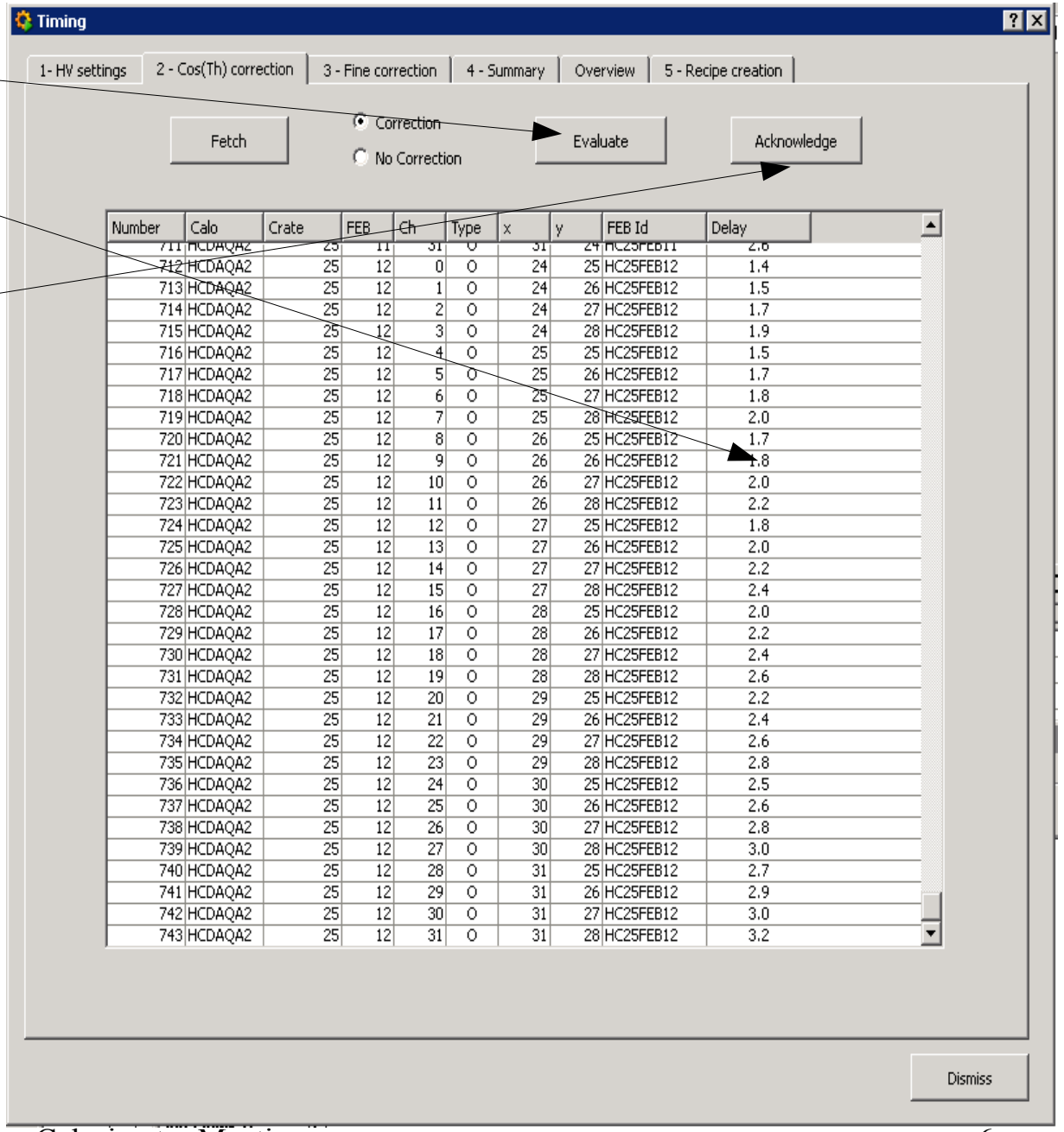


Number	Calo	Crate	FEB	Ch	Type	x	y	FEB Id	Delay
712	HCDAQA2	25	12	0	0	24	25	HC25FEB12	
713	HCDAQA2	25	12	1	0	24	26	HC25FEB12	
714	HCDAQA2	25	12	2	0	24	27	HC25FEB12	
715	HCDAQA2	25	12	3	0	24	28	HC25FEB12	
716	HCDAQA2	25	12	4	0	25	25	HC25FEB12	
717	HCDAQA2	25	12	5	0	25	26	HC25FEB12	
718	HCDAQA2	25	12	6	0	25	27	HC25FEB12	
719	HCDAQA2	25	12	7	0	25	28	HC25FEB12	
720	HCDAQA2	25	12	8	0	26	25	HC25FEB12	
721	HCDAQA2	25	12	9	0	26	26	HC25FEB12	
722	HCDAQA2	25	12	10	0	26	27	HC25FEB12	
723	HCDAQA2	25	12	11	0	26	28	HC25FEB12	
724	HCDAQA2	25	12	12	0	27	25	HC25FEB12	
725	HCDAQA2	25	12	13	0	27	26	HC25FEB12	
726	HCDAQA2	25	12	14	0	27	27	HC25FEB12	
727	HCDAQA2	25	12	15	0	27	28	HC25FEB12	
728	HCDAQA2	25	12	16	0	28	25	HC25FEB12	
729	HCDAQA2	25	12	17	0	28	26	HC25FEB12	
730	HCDAQA2	25	12	18	0	28	27	HC25FEB12	
731	HCDAQA2	25	12	19	0	28	28	HC25FEB12	
732	HCDAQA2	25	12	20	0	29	25	HC25FEB12	
733	HCDAQA2	25	12	21	0	29	26	HC25FEB12	
734	HCDAQA2	25	12	22	0	29	27	HC25FEB12	
735	HCDAQA2	25	12	23	0	29	28	HC25FEB12	
736	HCDAQA2	25	12	24	0	30	25	HC25FEB12	
737	HCDAQA2	25	12	25	0	30	26	HC25FEB12	
738	HCDAQA2	25	12	26	0	30	27	HC25FEB12	
739	HCDAQA2	25	12	27	0	30	28	HC25FEB12	
740	HCDAQA2	25	12	28	0	31	25	HC25FEB12	
741	HCDAQA2	25	12	29	0	31	26	HC25FEB12	
742	HCDAQA2	25	12	30	0	31	27	HC25FEB12	
743	HCDAQA2	25	12	31	0	31	28	HC25FEB12	

- The DB information on the cell position is used to evaluate the cos(θ) related delay
- You need first to « Fetch » the data from the previous tab
  - The table gets filled except for the last column
- You may chose to apply (physics) or not (TED, Cosmics) the geometrical correction

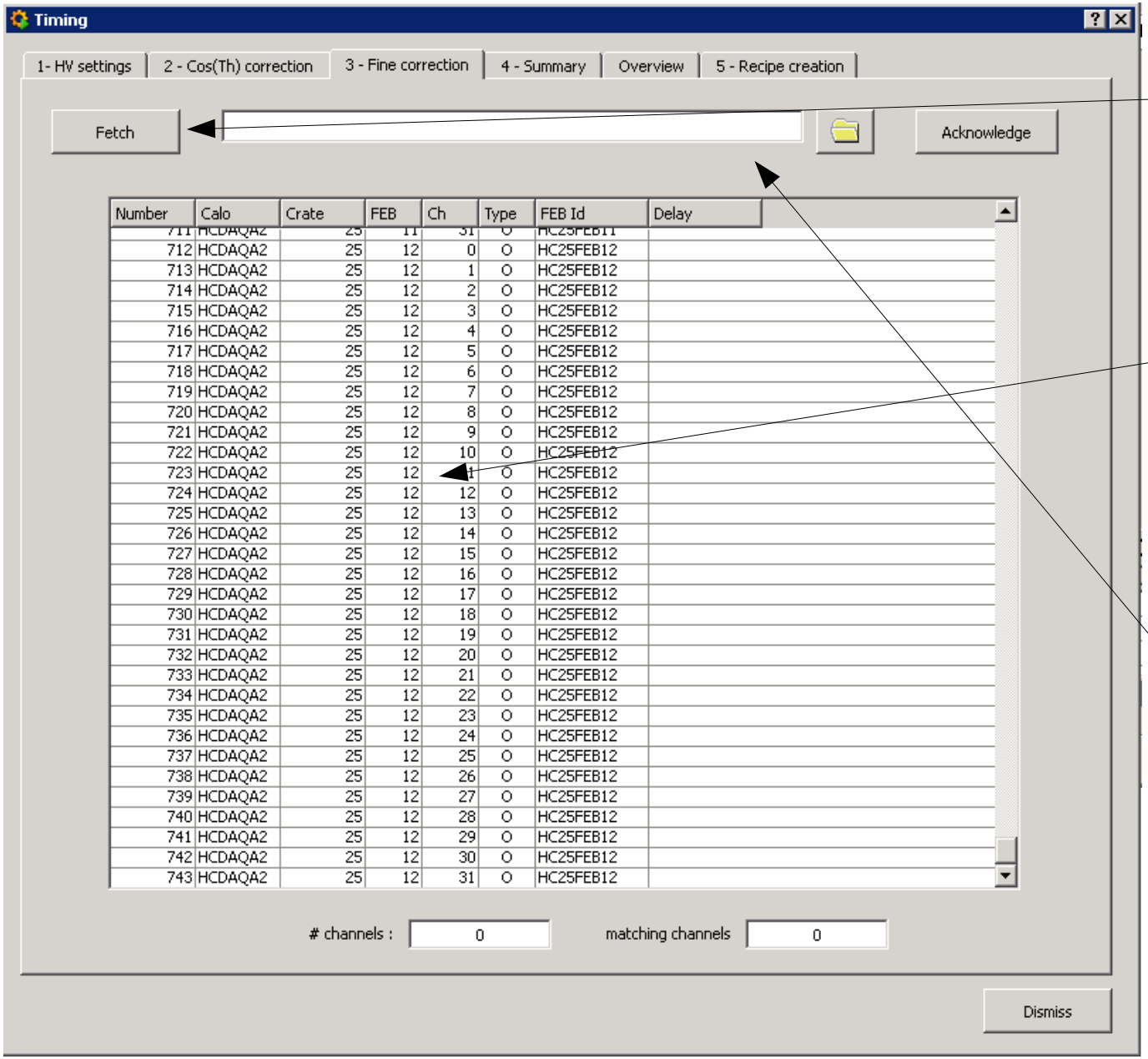
Cos (θ) correction

- « Evaluate » fills the last columns
- You HAVE to acknowledge to store the data at this stage
- Notice that pin diodes are not in the list and are not managed by these panels



Number	Calo	Crate	FEB	Ch	Type	x	y	FEB Id	Delay
712	HCDAQA2	25	12	0	0	24	25	HC25FEB12	1.4
713	HCDAQA2	25	12	1	0	24	26	HC25FEB12	1.5
714	HCDAQA2	25	12	2	0	24	27	HC25FEB12	1.7
715	HCDAQA2	25	12	3	0	24	28	HC25FEB12	1.9
716	HCDAQA2	25	12	4	0	25	25	HC25FEB12	1.5
717	HCDAQA2	25	12	5	0	25	26	HC25FEB12	1.7
718	HCDAQA2	25	12	6	0	25	27	HC25FEB12	1.8
719	HCDAQA2	25	12	7	0	25	28	HC25FEB12	2.0
720	HCDAQA2	25	12	8	0	26	25	HC25FEB12	1.7
721	HCDAQA2	25	12	9	0	26	26	HC25FEB12	1.8
722	HCDAQA2	25	12	10	0	26	27	HC25FEB12	2.0
723	HCDAQA2	25	12	11	0	26	28	HC25FEB12	2.2
724	HCDAQA2	25	12	12	0	27	25	HC25FEB12	1.8
725	HCDAQA2	25	12	13	0	27	26	HC25FEB12	2.0
726	HCDAQA2	25	12	14	0	27	27	HC25FEB12	2.2
727	HCDAQA2	25	12	15	0	27	28	HC25FEB12	2.4
728	HCDAQA2	25	12	16	0	28	25	HC25FEB12	2.0
729	HCDAQA2	25	12	17	0	28	26	HC25FEB12	2.2
730	HCDAQA2	25	12	18	0	28	27	HC25FEB12	2.4
731	HCDAQA2	25	12	19	0	28	28	HC25FEB12	2.6
732	HCDAQA2	25	12	20	0	29	25	HC25FEB12	2.2
733	HCDAQA2	25	12	21	0	29	26	HC25FEB12	2.4
734	HCDAQA2	25	12	22	0	29	27	HC25FEB12	2.6
735	HCDAQA2	25	12	23	0	29	28	HC25FEB12	2.8
736	HCDAQA2	25	12	24	0	30	25	HC25FEB12	2.5
737	HCDAQA2	25	12	25	0	30	26	HC25FEB12	2.6
738	HCDAQA2	25	12	26	0	30	27	HC25FEB12	2.8
739	HCDAQA2	25	12	27	0	30	28	HC25FEB12	3.0
740	HCDAQA2	25	12	28	0	31	25	HC25FEB12	2.7
741	HCDAQA2	25	12	29	0	31	26	HC25FEB12	2.9
742	HCDAQA2	25	12	30	0	31	27	HC25FEB12	3.0
743	HCDAQA2	25	12	31	0	31	28	HC25FEB12	3.2

Fine Corrections

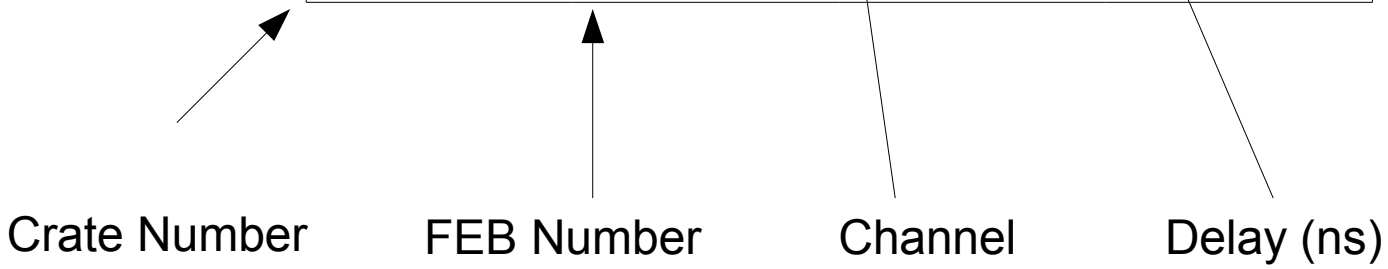


- As usual, you need to « Fetch » the data produced up to this stage
  - The table gets filled except for the last column
- You may add some fine corrections (extracted from TED, physics runs)
  - Corrections are in a text file that may be loaded

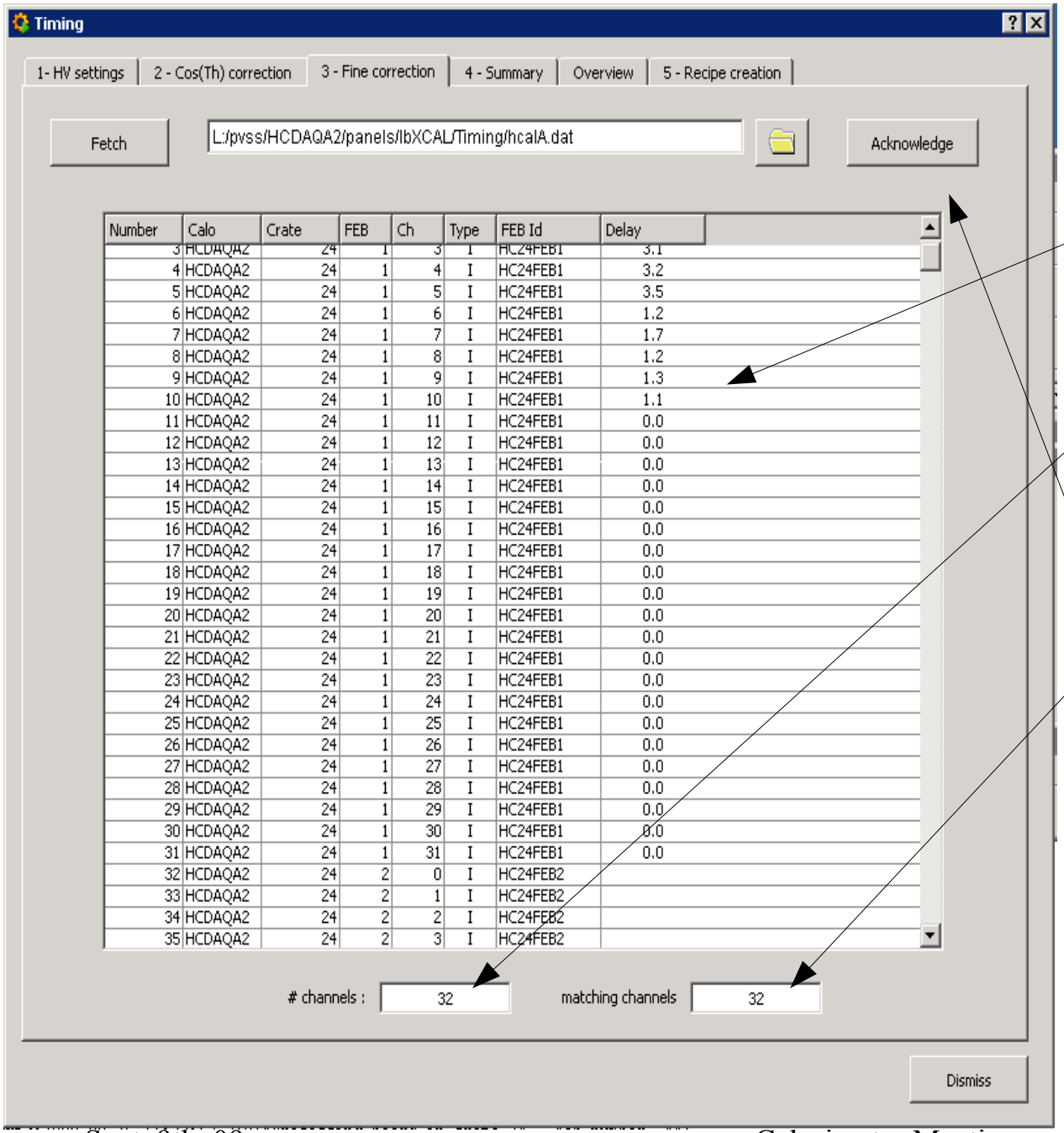
Fine Corrections

- **Text file format :**

24	1	0	1.2
24	1	1	1.5
24	1	2	1.3
24	1	3	0.9
24	1	4	0.9
24	1	5	1.5
24	1	6	1.2
24	1	...	...

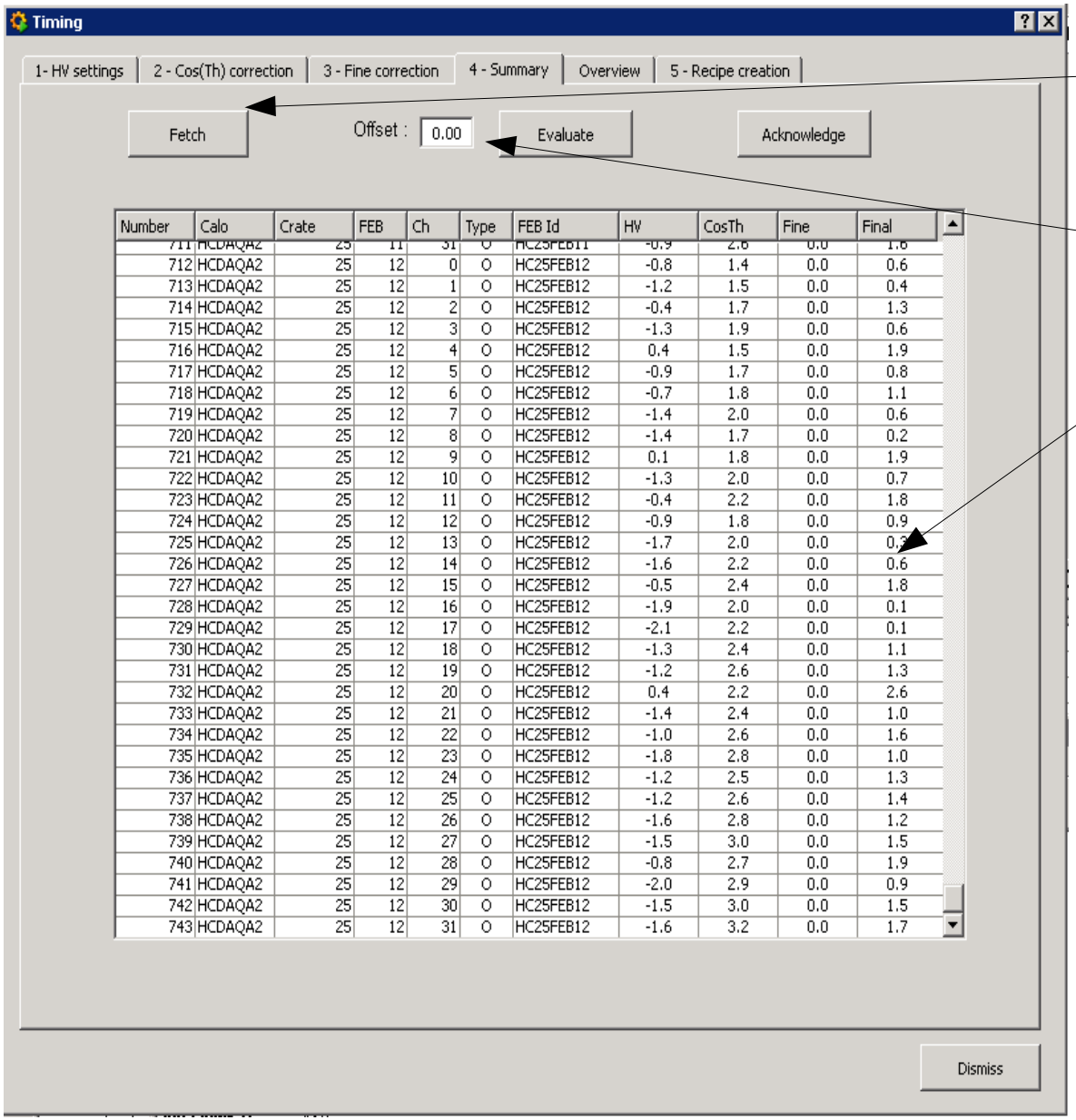


Fine Corrections



- Matching (table/file) cells get an extra delay in the last column
- The number of cells in the file and matching cells is given at the bottom
- To go to the next tab, you HAVE to acknowledge the corrections

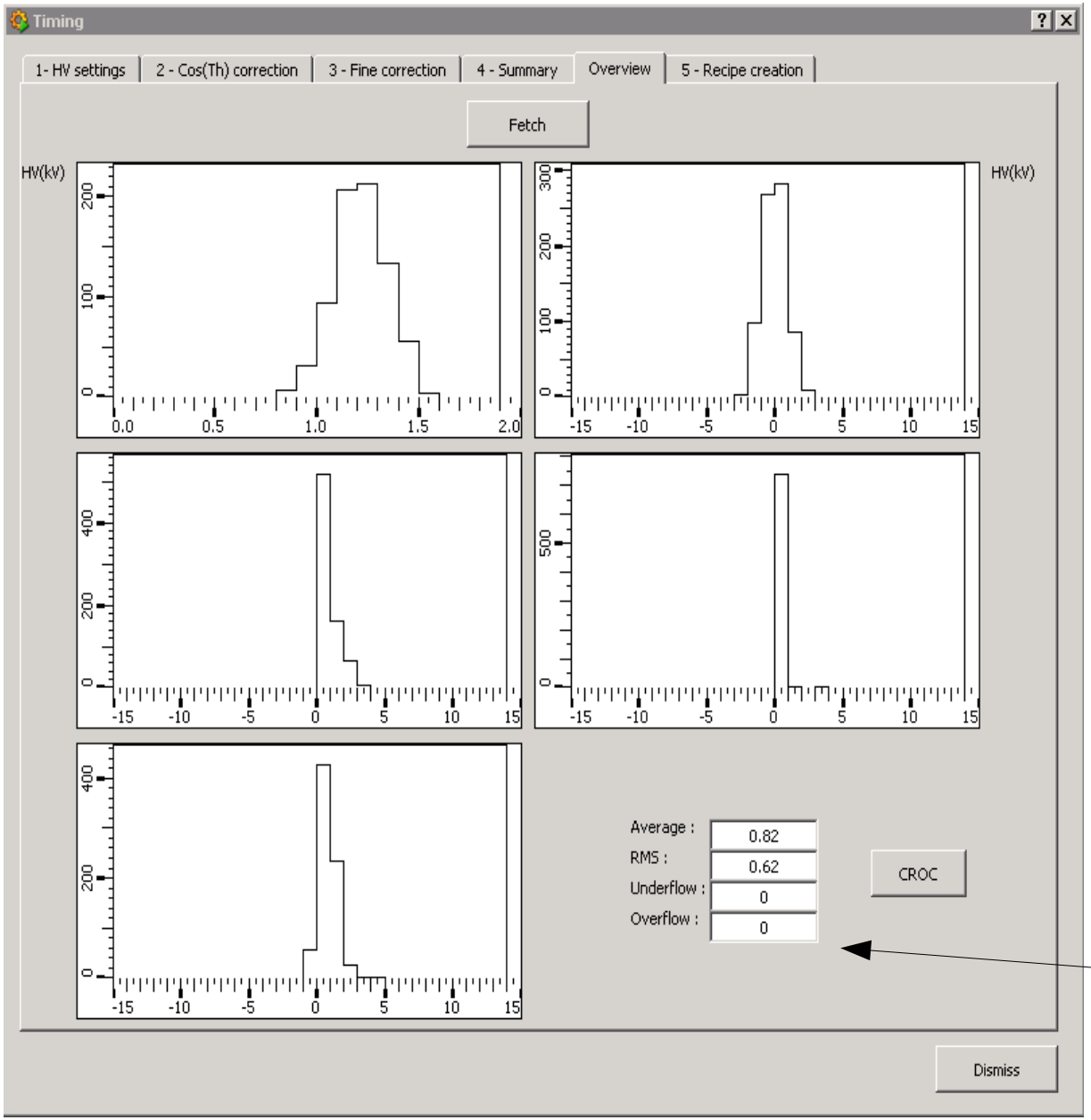
Final Correction



Number	Calo	Crate	FEB	Ch	Type	FEB Id	HV	CosTh	Fine	Final
712	HCDAQA2	25	12	0	O	HC25FEB12	-0.8	1.4	0.0	0.6
713	HCDAQA2	25	12	1	O	HC25FEB12	-1.2	1.5	0.0	0.4
714	HCDAQA2	25	12	2	O	HC25FEB12	-0.4	1.7	0.0	1.3
715	HCDAQA2	25	12	3	O	HC25FEB12	-1.3	1.9	0.0	0.6
716	HCDAQA2	25	12	4	O	HC25FEB12	0.4	1.5	0.0	1.9
717	HCDAQA2	25	12	5	O	HC25FEB12	-0.9	1.7	0.0	0.8
718	HCDAQA2	25	12	6	O	HC25FEB12	-0.7	1.8	0.0	1.1
719	HCDAQA2	25	12	7	O	HC25FEB12	-1.4	2.0	0.0	0.6
720	HCDAQA2	25	12	8	O	HC25FEB12	-1.4	1.7	0.0	0.2
721	HCDAQA2	25	12	9	O	HC25FEB12	0.1	1.8	0.0	1.9
722	HCDAQA2	25	12	10	O	HC25FEB12	-1.3	2.0	0.0	0.7
723	HCDAQA2	25	12	11	O	HC25FEB12	-0.4	2.2	0.0	1.8
724	HCDAQA2	25	12	12	O	HC25FEB12	-0.9	1.8	0.0	0.9
725	HCDAQA2	25	12	13	O	HC25FEB12	-1.7	2.0	0.0	0.3
726	HCDAQA2	25	12	14	O	HC25FEB12	-1.6	2.2	0.0	0.6
727	HCDAQA2	25	12	15	O	HC25FEB12	-0.5	2.4	0.0	1.8
728	HCDAQA2	25	12	16	O	HC25FEB12	-1.9	2.0	0.0	0.1
729	HCDAQA2	25	12	17	O	HC25FEB12	-2.1	2.2	0.0	0.1
730	HCDAQA2	25	12	18	O	HC25FEB12	-1.3	2.4	0.0	1.1
731	HCDAQA2	25	12	19	O	HC25FEB12	-1.2	2.6	0.0	1.3
732	HCDAQA2	25	12	20	O	HC25FEB12	0.4	2.2	0.0	2.6
733	HCDAQA2	25	12	21	O	HC25FEB12	-1.4	2.4	0.0	1.0
734	HCDAQA2	25	12	22	O	HC25FEB12	-1.0	2.6	0.0	1.6
735	HCDAQA2	25	12	23	O	HC25FEB12	-1.8	2.8	0.0	1.0
736	HCDAQA2	25	12	24	O	HC25FEB12	-1.2	2.5	0.0	1.3
737	HCDAQA2	25	12	25	O	HC25FEB12	-1.2	2.6	0.0	1.4
738	HCDAQA2	25	12	26	O	HC25FEB12	-1.6	2.8	0.0	1.2
739	HCDAQA2	25	12	27	O	HC25FEB12	-1.5	3.0	0.0	1.5
740	HCDAQA2	25	12	28	O	HC25FEB12	-0.8	2.7	0.0	1.9
741	HCDAQA2	25	12	29	O	HC25FEB12	-2.0	2.9	0.0	0.9
742	HCDAQA2	25	12	30	O	HC25FEB12	-1.5	3.0	0.0	1.5
743	HCDAQA2	25	12	31	O	HC25FEB12	-1.6	3.2	0.0	1.7

- Need first to fetch the previous timing data
- Possibility to add an overall offset
- Then pressing “Evaluate” fills the last column and lists the corrections for all the cells
- You HAVE to acknowledge those corrections before going to the next tab

Time correction plots

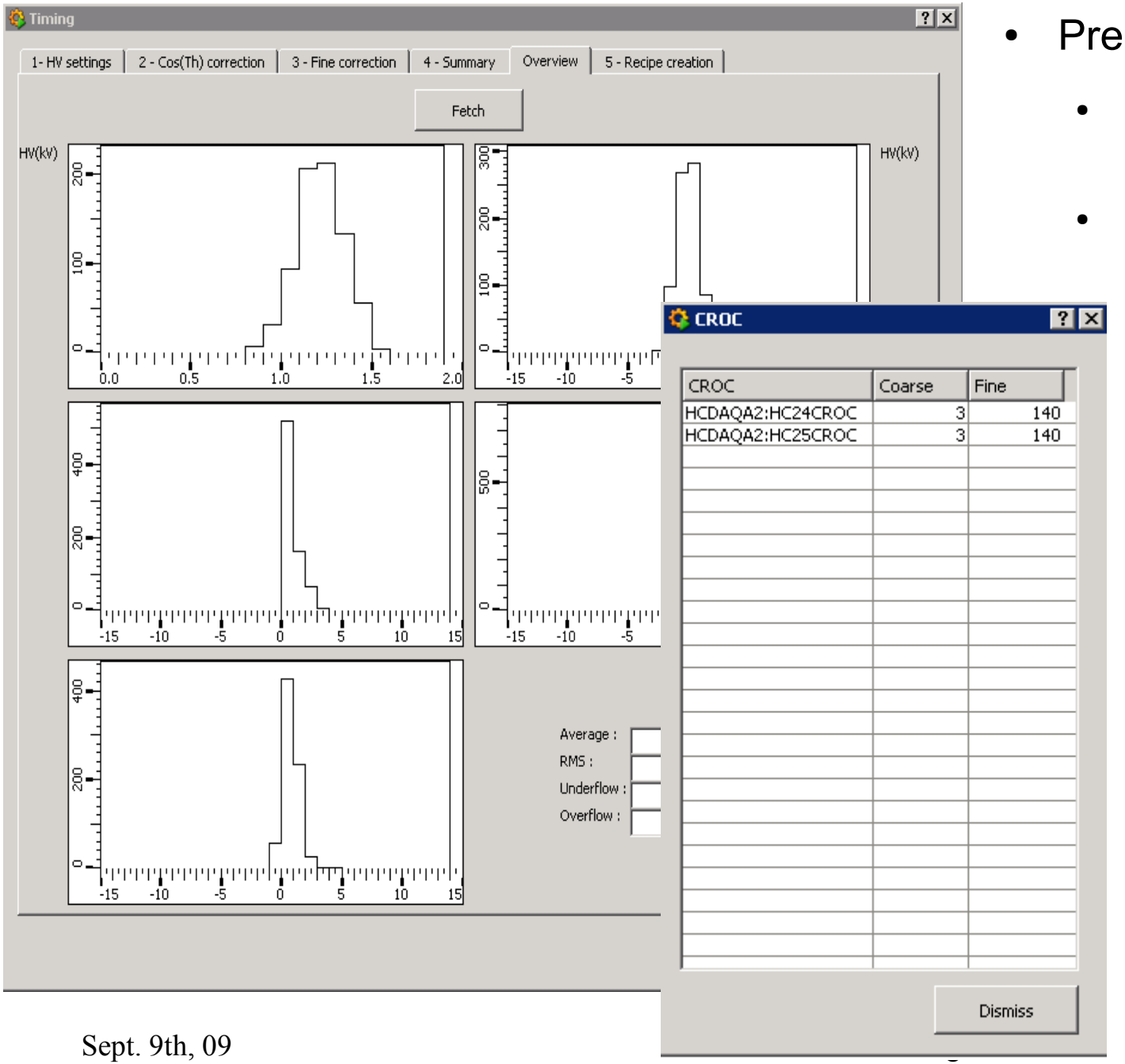


- First you need to “Fetch” the data presently stored in PVSS
- Plots may be drawn summarising the various corrections
  - HV
  - HV time corrections
  - Cos(q) delay
  - Fine corrections
  - Final correction
    - including offset

→ what will eventually be put into the electronics

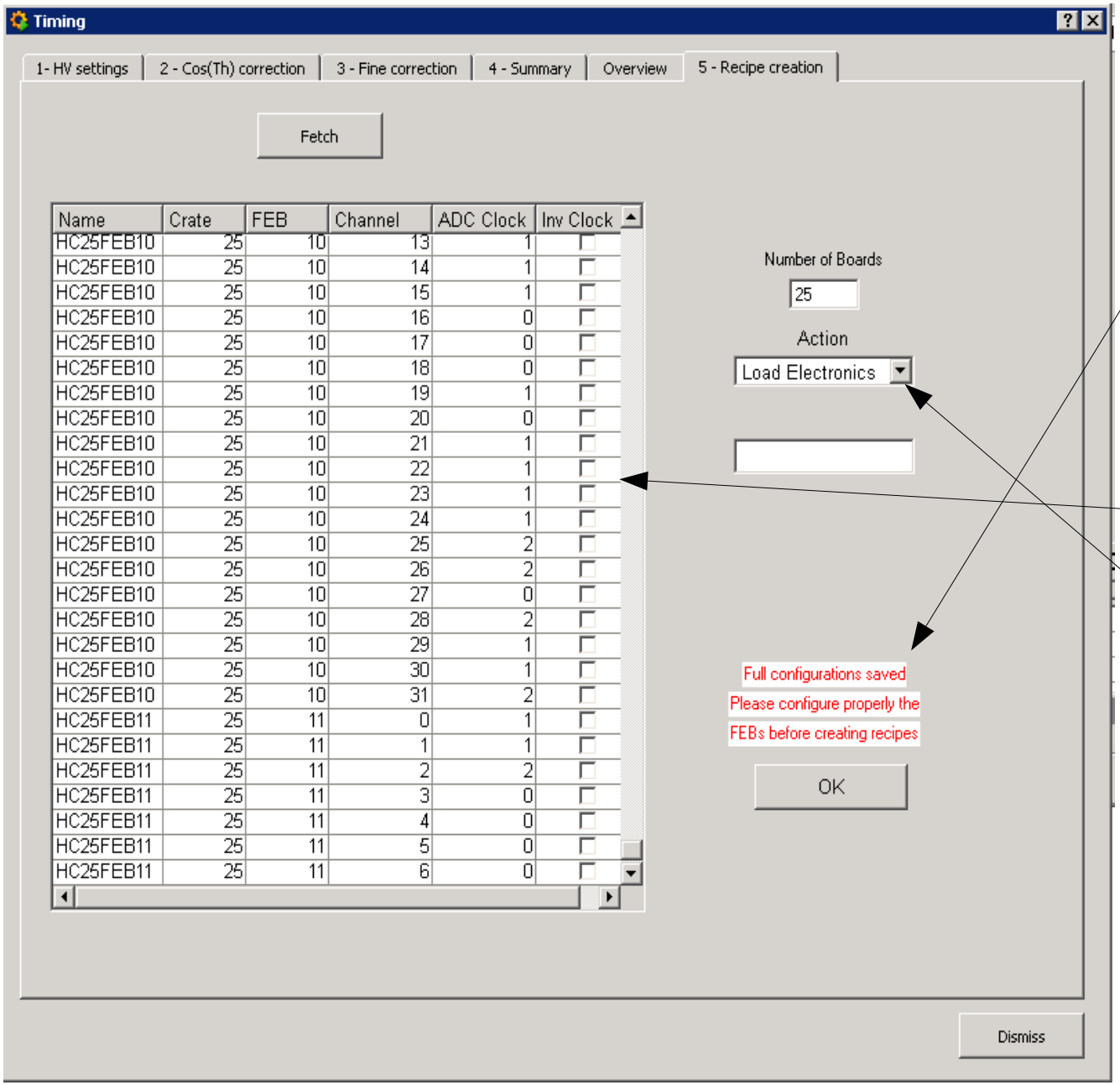
- Some information given on this last histogram

CROC configuration



- Pressing “CROC”
  - Gives the present configuration of the CROC
  - List given for the CROC accessible by PVSS
    - Same FSM node

Recipe creation

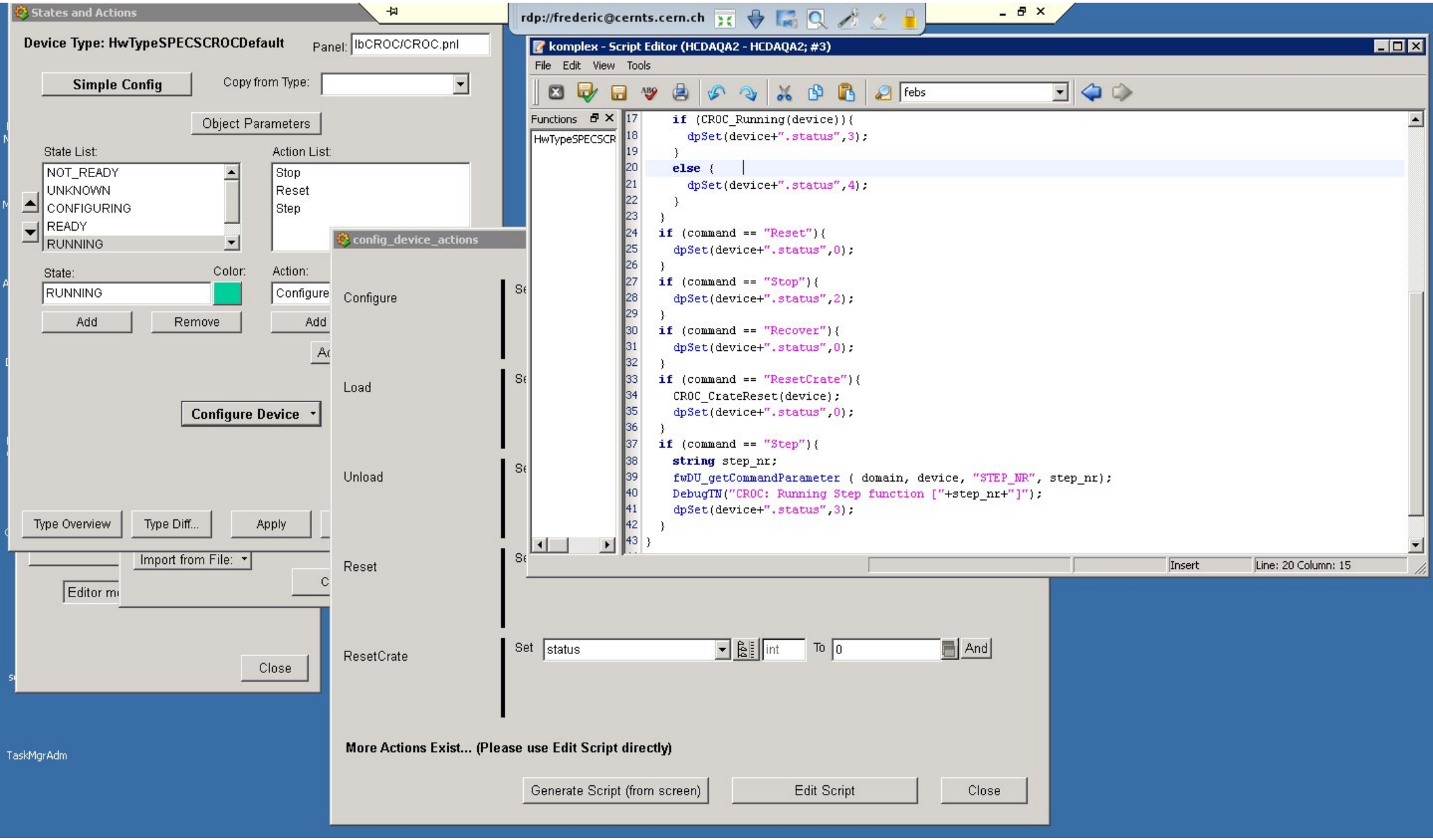


- The present configuration is kept but for the delay to make the new recipes
  - The other registers of the FEB need to be correctly set beforehand !
- If you “Fetch”, the global timings are converted in integer and listed in the table
- Invert/Direct clock registers tuned automatically
- Two actions possible :
  - Only load the electronics
  - Load first with new time settings and create recipes
    - You have to give a name for the new recipes
- Creating the recipes takes time
  - Button changed for 'processing' until action is completed (please be patient !)

Step Runs

- It is possible to split a run in several sub-runs : “steps”
  - After a certain number of events (imposed by the operator),
    - the run is paused
    - A specific configuration is requested
      - Most of the hardware
        - go directly into READY states when such a configuration is launched
        - this is the case at present for the XCAL FEB and CROC
        - So the “normal” configuration is not affected by such a “step”
    - A parameter is passed during that configuration : “STEP_NR”
      - This parameter can be used to tune the configuration for a specific step
        - Timing scan, threshold scan, ...
  - Present users of the Step functionality : LED scans for the calorimeter

Practical example



Practical example