MAGIC

Major Atmospheric

Gamma Imaging

Cerenkov Telescope

MAGIC-TDAS 01-01
010216/HKornmayer

The minutes of the software meeting in Barcelona February 2001

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(outdated)

Abstract

Here I summerized with the help of all the participants of the meeting the topics discussed. The following people joined in improvments for the MARS software.

- Ciro Bigongari
- Thomas Bretz
- Oscar Blanch
- Rudy Bock
- Harald Kornmayer
- Unknown Nobody

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1 Pre-Meeting Monday, 12th of February

participants: Oscar, Ciro and Harald

- Oscar, Ciro and Harald discussed some topic related with the Monte Carlo production. So Ciro informed about the progress in the MMCS code. Padua changed the output in a way that we get per run only up to 3 files. This will make life much easier for the production. He reported also on a comparison he and Denis Bastieri did in Padua where they compare the photons from the older version and the changed version. They don't find any differences. So this means that the new version of MMCS is ready to use. Harald reports that Munich starts with mass production using the new version. Padua will do the same very soon. The version will be put into the repository very soon and also there will be a new download version at the MAGIC Monte Carlo download page. This is scheduled for the end of next week.

- Ciro reports about the changes in the reflector, that were neccessary due to the new MMCS version (see above). There is a problem with 2 Float's nobody knows the origin of them (contact Jose Carlos). He promised that Denis and he will finish this work end of next week. They will put the new and tested version into the repository. If it is in there, Harald will put a new download version at the MAGIC Monte Carlo download page.

- Oscar mentioned that due to the changes in the MMCS and reflector program we also have to look for a new version of the starfield adder. He will do this job.

- Oscar reports about an acceleration method in the camera program. The problem was the speed when simulating a real starfield on the single phe level. For most of the events this means that the program is simulating only a large amount of starfield (background) photoelectrons. To speed this up, he and Harald decided to use a special data base for that. Most of the work was done already by Oscar. He mentioned some unavoidable changes on a program called starresponse, that is used to produce the data base for the acceleration. He will take care about that.

- There was a small discussion about the MMCS under linux. Harald mentioned some presentation of the Carles Domingo in the past and also a small email contact between Carles and himself. So far there were no changes and tests done. So it is not really sure that MMCS is running properly under linux. Carles should comment.

- The agenda for the next for days was discussed and it was decided to go for dinner on Tuesday.

2 Meeting Tuesday, 13th of February

participants: Oscar, Thomas, Ciro, Harald and Rudy in the afternoon

- Discussion about the “raw data” format after the “rootification”
  Harald reports on a thing that is not yet clear. The “readraw” program from the MARS package produces strange output for Monte Carlo files. The distribution of ADC-samples shows a peak at high entries. Also a look to the time slices shows this behaviour. We decided to look into that stuff on the meeting. May be it is a problem of camera or of the MRawEvtData format. (.... *we wait for a close look...*)

- Problem with more than 64-pixels
  Oscar reports about a bug. The event display in MARS shows always the same content for pixels

above the 62th pixel. Possible explanations for that are bugs in MRawEvtData, the iterator of MRawEvtData or the gui. (.... *we wait for a close look during the meeting ...*)

- Problem with Monte Carlo RawData
  Oscar produced some MC files with the MRawEvtData structure. Harald looked into this and found, that there are often entries with more then 250 ADC counts. During the meeting the error was fixed in the camera program and solved by Oscar.

- There was a discussion about the MRawEvtData format. So far, there were no tests of that. So Thomas will do this test for big files (up to 577 pixels) with a lot of events. Harald will send him the code programed by Razvan.

- Thomas wants to know details about the situation in the time stamp and absolute time calculation. Harald reported that there will be a new phd-student (called Vincenzo) very soon in Munich and he will study all that stuff in details.

- Thomas mentioned that a test of MARS running under the new root version (3.0/1) should be done soon. Oscar will do this. This doesn't mean that we will change the version: we will continue the development of MARS with root version (2.25/3).

- Discussion about the Monte Carlo data files

  - Harald just wants that the classes MMcEvt, MMcTrig, MHeaderTrig will inherit from MParContainer. Thomas and Oscar will do this, because is will be no problem.
  - It was mentioned that the CHANGELOG file in the MARS directory must be updated by the MC developer whenever the MARS code is effected by changes at the MC code.
  - Detailed discussion about the name of the following classes and their members.

    1. MMcEvt
       Will contain the information of different number of Cherenkov photons on the simulation chain. (number on ground, number after reflector, number after camera....). It was mentioned that the number of photoelectrons will be seperated in a part coming from the shower and from background. It was mentioned by Oscar that due to the acceleration of the camera program using the database of responses, only the mean value can be stored.
    2. MMcTrig
       It was decided that the Bitmap of the level 1 trigger will be stored.
    3. MMcTrigHeader
       Discussion about the name. It was decided that the information of a standard response for the trigger must be stored here.
    4. MMcFadcHeader
       It was decided that the information of a standard response for the FADC signals must be stored here.

  - Oscar will implement these changes asap.
  - Oscar and Harald will concentrate after that changes in the development of the first MC analysis jobs using MARS.

- Presentation of the current status of MARS

  - Harald presents the newest (still hot) version of MARS.
  - The "merging and preprocessing" programm called "merpp" was programmed by Thomas and is running. You just start it with ¿¿ merpp binary-input-file root-output-file ¡¡.
  - Then one is able to look into the data using a programm called "readraw" (You start it by typing ¿¿ readraw root-file ¡¡ from the MARS directory). With that tool you can see the content of the cosmic ray "events".
  - Harald presents the first version of the mars (gui) program.
  - It is possible to look with and EventDisplay into the time slices for each event and each pixel. The class MGFadcDisp is doing this job.
  - There is a first version of code that produces the FADC samples spectra for all pixels. Also the first gui to browse the Histograms was shown.
  - Also the first version of a new Data class called MNphotEvent was presented. With that class the program is able to show the events on a display with the layout of MAGIC.
- Due to some inconsistent warning produced by the code, a discussion started about the storage of histograms and the overall targets of development (This is for the next day...)
- A look into the tent of the octobertest. Unfortuneatly we don't find any "Mass" there!!!!

3 Meeting Wednesday, 14th of February

participants: Oscar, Thomas, Ciro, Harald and Rudy

- A long discussion came up about the organisation of code in the example of "image cleaning". Thomas mentioned the separation of Containers and Methods as one of the advantages of the decided architecture (using task-lists and parameter-lists). On the other side it was mentioned by Harald that there are arguments to put the code of a method in the implementation of a class. In that case the usage of Tasks in the Tasklist is still possible. In the case of Thomas all "intelligence" of the method is in the special Task, in the case of Harald the "intelligence" is in a memberfunction of a class and this memberfunction is called from a Task out of the Tasklist. There are arguments for both designs. There is no right and wrong decision possible. So we came to the conclusion that both styles are allowed. But as a guideline for programers we will use the style of Thomas, and only for "standard calculations" it is worth to declare them as memberfunctions in the class. No one will be killed by using one or the other style.
- Discussion about the future work for the documentation
  - In the web documentation of MARS (see http://magic.uni-sw.gwdg.de/mars/) we decided that is is worth to seperate the documentation for classes from MARS (names start with "M") and classes from ROOT (names start with "T"). Thomas will do this asap.
  - It was mentioned by all present persons that the current status of the class descriptions from MARS is not in a good shape. The reason was the fast development of a first running system over the last month after the christmas crisis. Everyone of the group must contribute to make a better documentation.
  - A first version of a user guide will be written by Rudy.

- The documentation of the Monte Carlo program needs more investigations:
  * MMCS - Harald will take care
  * reflector - Ciro will take care
  * camera - Oscar will take care

- Taking data with the minidaq program
  On the afternoon, we went to the octobertest container and were able to see pulses and signals on the scope and on the "labview" program. We started the minidaq program for 32 high gain samples and 32 low gain samples. Using merpp and mars to display this data did NOT lead to a nice output. So we started to look for the mistake in the programs. We found out that the data written by minidaq and the data used by mars are the same. This gave us the hint that there may be an error in the minidaq program.

4 Meeting Thursday, 15th of February

participants: Oscar, Thomas, Ciro, Harald, Rudy and Thomas Schweizer

- Thomas Schweizer starts an effort to bring his ideas into the MARS framework. He presented his C++ implementation of an analysis for CT1. The main design rule he followed was inheritance. We discussed some of his ideas from the view point of MARS, which uses as a design rule the separation of Parameters and Tasks. This is somehow in small contradiction with the idea of Thomas. But still there are good chances to bring idea and code from the existing CT1 analysis (Thomas S.) into MARS. But this can not simply consist of copying Classes from Thomas Schweizer into MARS, without any changes; we must adopt the code to the MARS enviroment. The timescale for such a change for one analysis idea was estimated from half-a-day (Thomas B.) up to a few days (Harald). But the conclusion was that such an effort should be done as soon as possible. The MARS group expressed their interest in all of the ideas of Thomas.

- Discussion about the whole analysis chain
  On a white board we discussed the whole analysis chain including all the subsystems. We come to a scheme that looks like the simple drawing of figure 1 (below).

  That discussion was very good for an overview of the system we have to write. Harald offered such a presentation for the eng meeting.

- Taking a new set of raw data with the octobertest setup! We found that all existing files are corrupted, the reason being an unknown error in minidaq. If you record data with too many samples per high and low gain, the output is not valid. If one starts minidaq, take only data with $<$ 50 slices (including both the High- and Low-gain samples). So taking 15 high gain and 15 low gain slices give the right result!!

  With this new run we checked our merpp and mars programs, and we were able to analyse data!!!!! Conclusion :

We have seen FIRST LIGHT for MAGIC

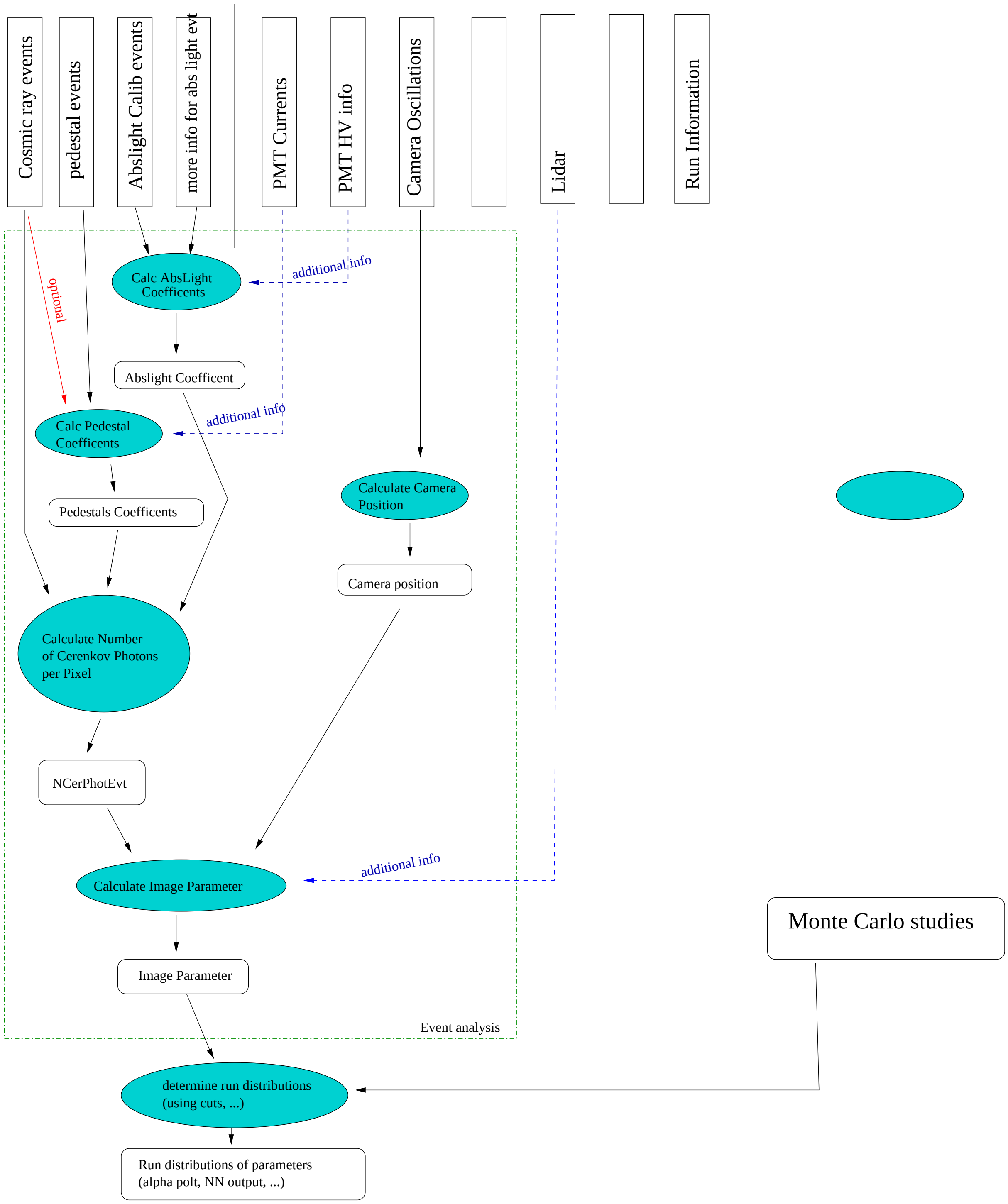

Figure 1: First scheme of all the analysis steps and relations between different parts of the MAGIC daq system