Services tasks: (recent) history and status report

L. Perrone

Document on Service Task Policy approved at the Ischia meeting by the CB
(document and details in the CB web site, along with the presentation given by Antonio)

Definition of Service Tasks

(citing the document..)

A service task is any work done in relation to the operation, maintenance, calibration and monitoring of the Pierre Auger Observatory.

Contributions to the software that guarantee a high-quality performance of the data acquisition, offline data processing, simulation packages and the official Monte Carlo production enter in the category of service tasks.

After Ischia meeting

Preliminary list of service tasks prepared, following the Detector and foundation task leaders suggestions

…. Malargue 11/2015

A layout document form will be distributed to detector analysis and foundations tasks leaders.

Task leaders will have to fill up the forms

- one form per each service task required
(expected few up to ten forms per each detector task.
There will be also service tasks in common with two tasks)

- send them back to us (Tiina and myself) by the end of the year.

The filled form will be made public to the collaboration in a dedicated web site at the beginning of next year (likely the one already set up by Antonio)

The management will take care of the implementation following the document approved last June

Example

Form suggested by F. Sarazin

Service Task name
Contact persons

Description and reference (web,etc..)

Expectation and time scale

Requirements

References

Service task – Pierre Auger Observatory

Task: Calibration, Operation and long term operation

Project: **Monitoring of the time evolution of FD calibration constants**

Contact: G. Salina (INFN Roma2, salina@roma2.infn.it), C. Di Giulio (INFN Roma2, digiulio@roma2.infn.it)

(FD) Calibration task leader and (FD) Long term task leader.

Objective
(What is the science and/or engineering in this project? Why would it be interesting to work on it?)
The study of the time evolution of calibration constants is a key topic both for the calibration and the long term tasks. Monitoring the stability of the FD detector is the main goal.
Addressing issues possibly affecting the energy scale is a strong motivation for this study.

Prior Background
(What is the history of this topic, including previous project outcomes?)
Have a look at the given references and at the link at the web site http://augerdba.roma2.infn.it/

Expectations
The individual or group undertaking this project is expected to manage scripts to analyze the FD data from the Auger Observatory, in particular the calibration data collected every night during the DAQ data taking. Some existing programs will be made available upon request. Progress reports and presentation at collaboration meetings are expected

Support
(Who will be directly interacting with the individual / group)
The indicated task leaders will provide support for the individual/group to get started, and provide guidance when necessary.

Resources needed and recommended skills
(What equipment, algorithms, and facilities should be available at the participating institutions)
Access to Auger data, including databases for analysis and the FD Calibration database in particular.
Knowledge of mysql, root and bash/php scripts would be helpful.

Technical References
(Identify a few key starting points; journal citations, prior reports, instruction manuals, etc.)

[1] Automated procedures for the Fluorescence Detector calibration at the Pierre Auger Observatory, G. Salina for the Pierre Auger Collaboration, 34th ICRC, The Haugue, The Netherlands.
[2] …….

Status

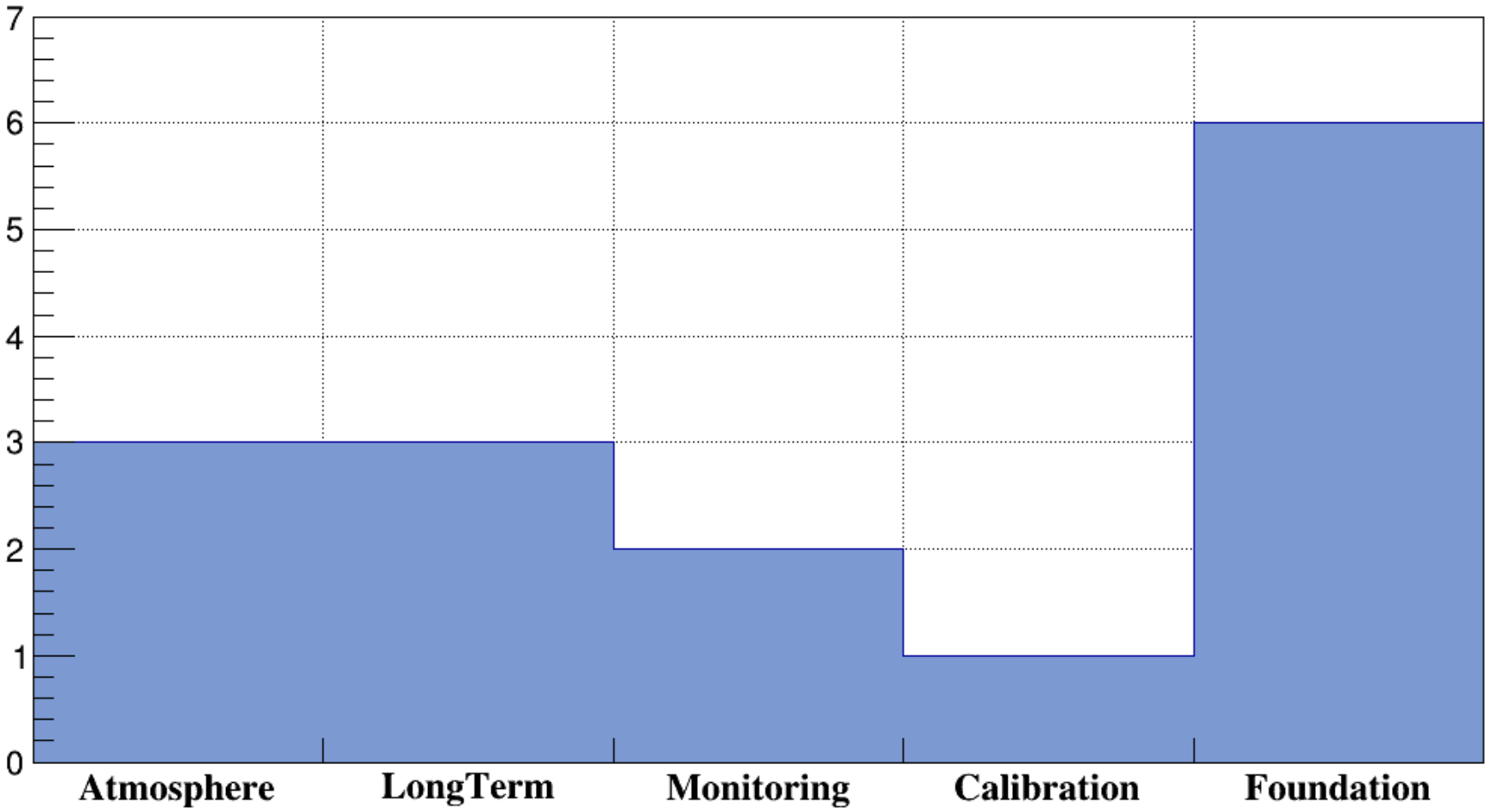
Deadline passed, feedback fully consistent with zero till January 2016

…..... since then, many peer to peer i(n)terations

Up today 15 service tasks have been identified

… at the end quite good..

Service Task Requests



...as received from the task leaders so far.

Atmosphere

Multiple Scattering

Service task – Pierre Auger Observatory

Task: Atmospheric Monitoring
Project: **Multiple Scattering Implementation in simulations**
Contact: Laura Valore (Univ. And INFN Napoli, valore@na.infn.it) Max Malacari (Adelaide University, maximus.malacari@adelaide.edu.au)

Objective
Implementation of the multiple scattering corrections in the Laser Simulation

Prior Background
Multiple scattering of light in the laser simulation was never implemented. Studies done by the Adelaide group pointed out the importance of including this effect in the laser simulation to obtain the correct number of photons in the light profiles analyzed for the aerosol measurements.

Expectations
Implement the parametrized multiple scattering in the Offline laser simulations and study the effect on simulated profiles expecially in the lower part of the atmosphere.

Support
M. Malacari from the University of Adelaide / L. Valore from the Univ. Of Napoli

Resources needed and recommended skills
Some experience with the Auger Offline and data analysis

Technical References
[1] https://www.auger.unam.mx/AugerWiki/AerosolSystematics (see M. Malacari presentations)

Raman Analysis

Service task – Pierre Auger Observatory

Task: Atmospheric Monitoring
Project: **Raman vs Standard Methods (Laser Simulation, Data Normalized)**
Contact: Laura Valore (Univ. And INFN Napoli, valore@na.infn.it) Carlos Medina (Colorado School of Mines, cmedina@mymail.mines.edu) Vincenzo Rizi (Univ. of L'Aquila – CETEMPS, vincenzo.rizi@aquila.infn.it)

Objective
A detailed comparison of the aerosol profiles measured with the Raman Lidar to those measured using the CLF/XLF based analyses is under way but still need more work. A precise evaluation of the systematic uncertainties related to Raman measurements is mandatory to have a good reference. If the discrepancy in the preliminary results is confirmed, a strategy to modify the techniques used to produce the aerosol profiles filling the aerosol database must be decided and applied.

Prior Background
The Raman Lidar is the deputy instrument to measure the aerosol attenuation profiles in the atmospheric community. A Raman lidar is running at the CLRF site since 2013, and preliminary results show higher VAOD profiles (2 sigma or more) than those measured with the standard CLF/XLF based methods (Laser Simulation and Data Normalized analyses) that are used to produce aerosol profiles for the Aerosol Database since 2004.

Expectations
precise evaluation of uncertainties in Raman measurements, comparison of 2 years of data and strategy to correct the CLF/XLF based techniques to produce new aerosol database entries if the discrepancy is confirmed.

Support
Napoli (L. Valore) / CSM (C. Medina) / L'Aquila (V. Rizi, A. Grillo)

Resources needed and recommended skills
Experience with data analysis

Technical References

[1] *"Techniques for measuring aerosol attenuation using the Central Laser Facility at the Pierre Auger Observatory" by The Pierre Auger Collaboration (L. Valore corresponding author). JINST 8 P04009, 2013*
[2] *"The Lidar System of the Pierre Auger Observatory", Nucl.Instrum.Meth. (2007) A574:171-184*

Lidar Analysis

Service task – Pierre Auger Observatory

Task: Atmospheric Monitoring
Project: **Clouds : Lidar Data Analysis**
Contact: Roberto Mussa (INFN Torino)

Objective
Analysis of Lidar data to measure the clouds altitude needed in the composition measurements. Analysis of horizontal shots can be used to measure the horizontal aerosol attenuation at low altitudes.

Prior Background
Elastic lidars performing scans above the FDs FOV are used to measure the clouds altitude. Lack of manpower is causing a delay in data release.

Expectations
data analysis of the last 2 years of elastic lidar data to produce cloud altitude profiles. Study of the horizontal shots.

Support
R. Mussa (INFN Torino)

Resources needed and recommended skills
Experience with data analysis.

Technical References
[1] *"The Lidar System of the Pierre Auger Observatory", Nucl.Instrum.Meth. (2007) A574:171-184*

Long Term

Hybrid performance

Service task – Pierre Auger Observatory

Task: Hybrid performance, Operation and long-term performance
Project: **Hybrid Performance of the Pierre Auger Observatory**
Contact: L. Perrone (Università del Salento and INFN Lecce, lorenzo.perrone@le.infn.it)
Hybrid Detector performance task leader.

Objective

Derive and monitor the hybrid ontime and metrics as a function of time for all telescopes.
Rate of hybrid events as a function of time.
Status of the databases (FD Calibration and atmosphere for analysis)
Data quality and assessment of the stability of the performance hybrid detector

Prior Background
Knowledge of the FD and SD Detector components and of their interplay. Basic analysis tools.

Expectations
The individual or group undertaking this project is expected to manage scripts to analyze the data from the Auger Observatory. Use of Offline and ADST files recommended. Some basic analyses could also be done using monitoring data, which may be easier to get started for newcomers. Some existing programs will be made available upon request. Progress reports and presentations at collaboration meetings are expected

Support

The hybrid detector task leader will provide support for the individual / group to get started, and provide guidance when necessary. The work will be done in collaboration with the Operation and long term task leaders.

Resources needed and recommended skills

Access to Auger data, including hybrid ontime root files , ADST files and monitoring data. Offline installation recommended.

Technical References

[1] The Pierre Auger Collaboration, Astroparticle Physics 34 (2011) 368–381

Data preservation

Service task – Pierre Auger Observatory

Task: Long Term Performance
Project: Data preservation
Contact: C. Di Giulio (claudio.digiulio@roma2.infn.it) L. Perrone (Lorenzo.Perrone@le.infn.it)

Objective
Provide the tools to access data and reanalyze them in future, beyond 2024.
Auger is a unique experiment and our data and their related knowledge shall not be lost.

Prior Background
There is no previous reference on this topic in Auger. The experience gained by Claudio in his work at ESA can offer interesting hints concerning data preservation as inspired by long term programs of space missions (20 years). Work to be developed in close contact to the data release committee.

Expectations
A first step could be to create and send a survey to each task to identify the relevant long term information (data, software and documentation that should not be lost in future). This will define the "Preserve Data Set Content".

Support
The contact persons will provide support for the individual / group to get started, and provide guidance when necessary. The work will be done in collaboration with all the task leaders.

Resources needed and recommended skills
The Pierre Auger Observatory data sources and all the available documentation. Data preservation strategy and could be a plus. (Ontology and data catalogue). The OAIS standard could be explored [1]. The CERN has discussed the problem [2] and the USGS too. The HEP work has discussed the problem in [4] and the APPEC Astroparticle Physics European Consortium too [5].

Technical References
[1] https://en.wikipedia.org/wiki/Open_Archival_Information_System
[2] http://hep-project-dphep-portal.web.cern.ch
[3] USGS Guidelines for the Preservation of Digital Scientific Data
[4] http://arxiv.org/pdf/0912.0255.pdf
[5] http://arxiv.org/pdf/1512.00988.pdf par. 3.4 page 17 Data preservation

PMT test

Service task – Pierre Auger Observatory

Task: Reference Task(s) Long Term in collaboration with SDE
Project: **Service task name: Test of Chinese PMTs**
Contact: Tiina Suomijärvi, tiina@ipno.in2p3.fr

Objective
We need to order more XP1805 PMTs for the Surface Detector. We have currently 9 of these PMTs in the field and we need to assess their performances before we can order more of these PMTs.

Prior Background

Expectations
We need a report on various monitoring parameters and data quality parameters (PMT HV and current, VEM, A/P, trigger rates, noise etc.).

Support
Tiina Suomijärvi

Resources needed and recommended skills
Access to the Auger monitoring and data analysis programs.

Technical References
[1] Presentation of Tiina Suomijärvi in the Malargüe meeting PMT session on 7 March 2016.

[2] GAP notes on the XP1805 PMTs by UCLA.

Monitoring

Calibration

SD Monitoring

Service task – Pierre Auger Observatory

Task: Monitoring

Project: SD Data Quality Monitoring

Contact: C. Berat (LPSC, Grenoble, berat@lpsc.in2p3.fr) J. Rautenberg (Bergische Universitaet Wuppertal) jrautenberg@uni-wuppertal.de)
Monitoring task leaders

Objective
Implementation of Data Quality (DQM) plots. Defining and applying procedures aimed at the monitoring of data quality for the surface Detector. Define the appropriate event parameters to be checked by SD shifters to insure quality of Auger data.

Prior Background
The materials given in the references describe and document the monitoring program of the Pierre Auger Observatory. Additional and technical information are provided on the wiki pages (http://wiki.auger.org.ar/doku.php?id=monitoring:main)

Expectations
The individual or group undertaking this project is expected to manage scripts to get information from the Auger data files (ascii or root files) containing reconstructed events, and to display relevant information on the monitoring web site. Some existing scripts under development will be made available upon request. Progress reports and presentations at collaboration meetings are expected. Documentation to guide future SD shifters should be written on wiki.

Support
The monitoring task leaders will provide support for the individual / group to get started, and provide guidance when necessary. The work will be done in collaboration with the analysis foundation task leaders. There should be also collaboration with person(s) in charge of FD DQM task.

Resources needed and recommended skills
Access to Auger data.
Knowledge of: mysql, root, bash, php, javascript would be necessary.
Library HighCharts.js may be used for plot production.

Technical References
[1] GAP 2010-103
[2] The monitoring system of the Pierre Auger Observatory and its additional functionalities, J. Rautenberg for the Pierre Auger Coll., 31st ICRC 2009, Lodz, Poland
[3] Login and roles : http://wiki.auger.org.ar/doku.php?id=monitoring:user:loginandrolepage
[4] Quick Start : http://mon.auger.uni-wuppertal.de/daily/Doc/QuickStart.pdf
[5] User Guide : http://wiki.auger.org.ar/doku.php?id=monitoring:user

FD Monitoring

Service task – Pierre Auger Observatory

Task: Monitoring

Project: **Data Quality for FD using the Auger monitoring**

Contact: C. Berat (LPSC, Grenoble, berat@lpsc.in2p3.fr) J. Rautenberg (Bergische Universitaet Wuppertal) jrautenberg@uni-wuppertal.de)
Monitoring task leaders

Objective
Implementation of Data Quality (DQM) plots for FD. Defining and applying procedures aimed at the monitoring of data quality for the fluorescence detector.

Prior Background
The materials given in the references describe and document the monitoring program of the Pierre Auger Observatory. Additional and technical information are provided on the wiki pages (http://wiki.auger.org.ar/doku.php?id=monitoring:main)

Expectations
The individual or group undertaking this project is expected to manage scripts to analyze data from the Auger Monitoring. Some existing programs will be made available upon request. Progress reports and presentations at collaboration meetings are expected

Support
The monitoring task leaders will provide support for the individual / group to get started, and provide guidance when necessary. The work will be done in collaboration with the Operation and long term task leaders.

Resources needed and recommended skills
Access to Auger data. Knowledge of mysql, root and bash/php scripts would be helpful.

Technical References
[1] GAP 2010-103

[2] The moniroting system of the Pierre Auger Observatory and its additional functionalities, J. Rautenberg for the Pierre Auger Coll., 31st ICRC 2009, Lodz, Poland

Calibs Time evolution

Service task – Pierre Auger Observatory

Task: Calibration, Operation and long term operation

Project: **Monitoring of the time evolution of FD calibration constants**

Contact: G. Salina (INFN Roma2, salina@roma2.infn.it), C. Di Giulio (INFN Roma2, digiulio@roma2.infn.it)
(FD) Calibration task leader and (FD) Long term task leader.

Objective

The study of the time evolution of calibration constants is a key topic both for the calibration and the long term tasks. Monitoring the stability of the FD detector is the main goal.
Addressing issues possibly affecting the energy scale is a strong motivation for this study.

Prior Background
Have a look at the given references and at the link at the web site http://augerdba.roma2.infn.it/

Expectations
The individual or group undertaking this project is expected to manage scripts to analyze the FD data from the Auger Observatory, in particular the calibration data collected every night during the FD data taking. Some existing programs will be made available upon request. Progress reports and presentations at collaboration meetings are expected

Support
The indicated task leaders will provide support for the individual/group to get started, and provide guidance when necessary.

Resources needed and recommended skills
Access to Auger data, including databases for analysis and the FD Calibration database in particular.
Knowledge of mysql, root and bash/php scripts would be helpful.

Technical References
[1] Automated procedures for the Fluorescence Detector calibration at the Pierre Auger Observatory, G. Salina for the Pierre Auger Collaboration, 34th ICRC, The Haugue, The Netherlands.

Foundations

SD: baseline

Service task – Pierre Auger Observatory

Task: FOUNDATION
Project: **SD data Calibration: baseline, signal definition and T50**
Contact: I. Lhenry-Yvon, lhenry@ipno.in2p3.fr

Objective

The goal is the optimization of the signal selection in the FADC traces of the tanks. It includes baseline estimation and proper definition of start and stop time of the traces, and thus of T50.
This work is mandatory for properly performing any search for photons or neutrinos candidates as this requires very clean and reliable traces.

Prior Background
There has been already some work done on this that has to be taken into account. All that work is described there:
https://www.auger.

Expectations
The first step is to
problematic baselin
the baseline subtrac
validated on a very
A similar work has
in the FADC trace.

Support
Isabelle Lhenry-Yv

Resources neede
This work should b
to start with CDAS
independent groups

Technical Refer
https://www.auger.

SD: event reconstruction

Service task – Pierre Auger Observatory

Task: FOUNDATION
Project: **SD event reconstrution: Optimal use of LDF parameterizations**
Contact: I. Lhenry-Yvon, lhenry@ipno.in2p3.fr, M. Roth, markus.roth2@kit.edu

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Objective

The goal is to optimize the usage of lateral distribution functions (LDFs), one of the major ingredients for SD data reconstruction and analysis. Several attempts have been performed in the past to phenomenologically parameterize the functional dependencies of the the lateral distributions. In Offline the slopes of the LDF are fixed according to these parameterizations when fitting event-by-event, although events with large station multiplicities mostly at high energies may allow us to fit the slopes too. The objective of this task is to study systematic deviations of the two options (free vs fixed slope parameters), i.e. quantifying the differences to eventually making use of a constrained fitting procedure allowing for a variation of slopes within some predefined range.

SD: bad PMTs

Service task – Pierre Auger Observatory

Task: FOUNDATION
Project: **SD data Calibration: BAD PMT cleaning**
Contact: I. Lhenry-Yvon, lhenry@ipno.in2p3.fr

Objective

The goal is the optimization of PMT selection in the data analysis to ensure a clean data set with reliable integrated signals and traces. This work is mandatory for properly performing any search for photons or neutrinos candidates as this requires very clean and reliable traces.

Prior Background

There has been already some work done on this that has to be taken into account. All that work is described there:
https://www.auger.unam.mx/AugerWiki/FoundationsWorkingGroupSDEventSelection

Expectations
All PMTs quoted in the provided material and identified as pathological have to be treated with dedicated cuts. Corresponding events have to be checked, i.e. the FADC traces and the calibration block should be inspected in detail. Possibly new cut should be designed to increase the rejection efficiency. When a new cut is created, its impact on data should be carefully assessed.

Support
Isabelle Lhenry-Yvon, Markus Roth, Darko Veberic and Olivier Deligny

Resources needed and recommended skills
This work should be done with all software tools now available, namely with CDAS and Offline. It is recommended to start with CDAS to have a simple access to calibration parameters. Then the work has to be tested by two independent groups and the consistency of the outcome should be verified for both software tools.

Technical References
https://www.auger.unam.mx/AugerWiki/FoundationsWorkingGroupSDEventSelection

SD: validation

Service task – Pierre Auger Observatory

Task: FOUNDATION
Project: **SD event reconstruction: Validation of new releases**
Contact: I. Lhenry-Yvon, lhenry@ipno.in2p3.fr, M. Roth, markus.roth2@kit.edu

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Objective

The reconstruction codes used in Auger are matured since quite some time. Nevertheless, the event reconstruction undergoes continuously improvements and debugging. To ensure a high level of data integrity we envisage a continuous systematic validation of the reconstruction codes used.

Prior Background

The Offline reconstruction is documented and shipped with the code itself. The CDAS code has some documentation given on the CDAS webpage.

Expectations

With each new release of either Offline or CDAS we aim for a continuous inspection and validation of reconstructed quantities on event-by-event basis such as S1000, zenith, azimuth, etc. Moreover, distributions of quantities like zenith, S1000, S38, core positions etc. should be crosschecked as well. The event statistics of triggered and reconstructed events has to be compared between different releases to ensure unchanged 100% event statistics.

Support

Isabelle, Markus and further SD experts such as Darko and Olivier

Resources needed and recommended skills

This work is based on CDAS and Offline. C++ skills and experience with data interpretation are needed. Scripting of a high-level interpreter language (Python or cint within ROOT) are mandatory to develop the needed software.

Technical References

http://labdpr.cab.cnea.gov.ar/auger/cdas.php
https://www.auger.unam.mx/AugerWiki/OfflineSoftware

Foundations: software

Software: buildbot

Service task – Pierre Auger Observatory

Task: Offline Software
Project: **Enhanced Analysis Software Testing Coverage**
Contact: Tom Paul (Offline task co-leader, tompaulster@gmail.com)
Julian Rautenberg (Radio contact, Julian.Rautenberg@uni-wuppertal.de)

Objective
To ensure stability of the Offline software in light of its size and rapid growth, extensive testing is require. Such tests include unit tests and acceptance tests. Unit tests exercise underlying framework components, and are generally prepared by developers. Acceptance tests run full Offline applications and compare results to previous runs to identify cases in which unexpected changes are introduced. A decent acceptance testing framework is in place, but actual test coverage is not comprehensive. There is also the not-entirely resolved issue of validating Monte Carlo, as results are expected to change as algorithm development causes random seed sequences to shift. Some kind of statistical testing is probably in order.

Prior Background
Candidates for this task should have working knowledge of running applications in Offline, should be willing to learn the (simple) Offline testing tools, and should be willing to familiarize themselves with the buildbot tool which we use to automate the process. They will need commit privileges to the SVN repository. Understanding the buildbot requires learning a little python. Candidates should also be willing to periodically check on the health of the buildbot system, and be creative in devising new sorts of acceptance tests.

Expectations
This is an essential open-ended task, and will be ongoing for the lifetime of Auger analyses. It is not a one-off job which can be simply wrapped up after a fixed time. A typical work-load may be full time for a week or so, and a few hours per week commitment thereafter.

Support
Tom Paul, Lukas Nellen, Julian Rautenberg

Resources needed and recommended skills
Lehman College is expected to provide much of the hardware required for the testing, but other groups should also volunteer computers running a variety of OSs. Participants will be given an account on the Lehman server on which the buildmaster is running in order to assist with maintenance.

Technical References
[1] buildbot.net

Software: SQLite

Service task – Pierre Auger Observatory

Task: Offline Software
Project: **Vetting SQLite Databases**
Contact: Tom Paul (tompaulster@gmail.com)
Julian Rautenberg (Julian.Rautenberg@uni-wuppertal.de

Objective
The objective is to verify that the Auger SQLlite database provide superior performance as well as the same results as the original MySQL databases in a production environment.

Prior Background
Much of the Auger monitoring data is stored in MySQL databases, some of which are used for data production. Some time ago, it was noted that in a heavy production environment, MySQL usage is sub-optimal due to latency issues. In the interim, groups from Wuppertal University and Northestern University prepared a scheme to convert the MySQL databases to SQLite files, which can (in principle) be more efficiently used for production, and which may be quicker to replicate at remote sites. These have not yet been extensively adopted.

Expectations
Though initial checks indicate agreement between results when using the MySQL and SQLite versions of the databases, with similar performance, they have not been used (as far as we know) at large production centers. It seems worthwhile to explore this possibility.

Support
Tom Paul, Lukas Nellen, Julian Rautenberg

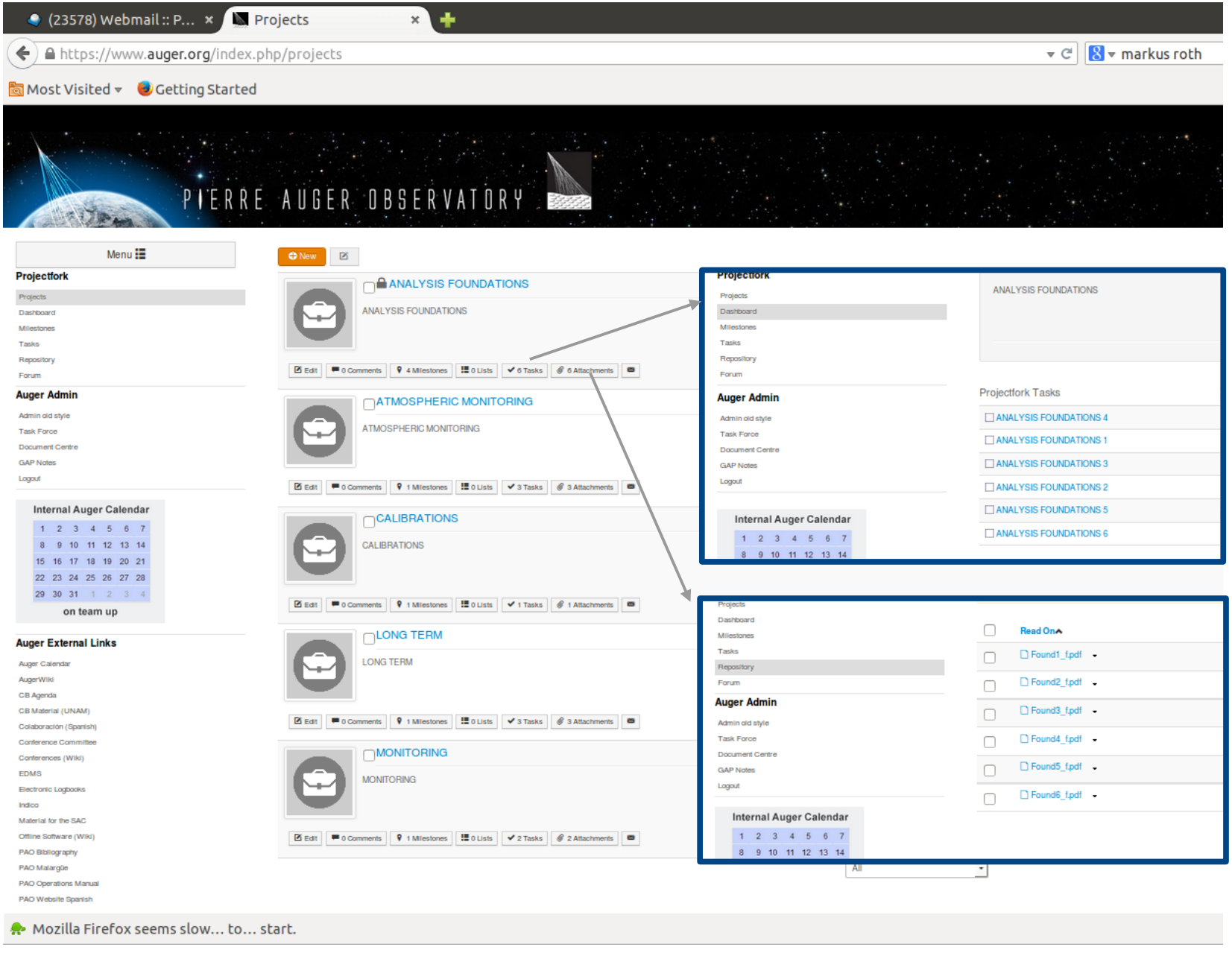
Resources needed and recommended skills
A large computing center (or GRID resources) at which the system can be tested, as well as familiarity with SQLite.

Technical References

[1] www.mysql.com
[2] www.sqlite.org

Web Posting

https://www.auger.org/index.php/projects



Conclusions

A list of key service tasks has been compiled using direct input of detector and foundation task leaders.

Tasks forms are being posted at the web site described in the approved document

https://www.auger.org/index.php/projects

Crucial tasks, now in the hands of very few persons, must be distributed to allow the Observatory efficiently operating along the next decade

Thank you

BACKUP

More Examples

Service task – Pierre Auger Observatory

Task: Hybrid performance, Operation and long-term performance

Project: **Hybrid Performance of the Pierre Auger Observatory**

Contact: L. Perrone (Università del Salento and INFN Lecce, lorenzo.perrone@le.infn.it)
Hybrid Detector performance task leader.

Objective
(What is the science and/or engineering in this project? Why would it be interesting to work on it?)
Derive and monitor the hybrid ontime and metrics as a function of time for all telescopes.
Rate of hybrid events as a function of time.
Status of the databases (FD Calibration and atmosphere for analysis)

Prior Background
(What is the history of this topic, including previous project outcomes?)
Add references.

Expectations
The individual or group undertaking this project is expected to manage scripts to analyze the data from the Auger Observatory. Use of Offline and ADST files recommended. Some basic analyses could also be done using monitoring data, which may be easier to get started for newcomers. Some existing programs will be made available upon request. Progress reports and presentations at collaboration meetings are expected

Support
(Who will be directly interacting with the individual / group)
The hybrid detector task leader will provide support for the individual / group to get started, and provide guidance when necessary. The work will be done in collaboration with the Operation and long term task leaders.

Resources needed and recommended skills
(What equipment, algorithms, and facilities should be available at the participating institutions)
Access to Auger data, including hybrid ontime root files , ADST files and monitoring data. Offline installation recommended.

Technical References
(Identify a few key starting points; journal citations, prior reports, instruction manuals, etc.)
[1]
[2]

Service task – Pierre Auger Observatory

Task: Monitoring

Project: **Data Quality using the Auger monitoring**

Contact: C. Berat (LPSC, Grenoble, berat@lpsc.in2p3.fr) J. Rautenberg (Bergische Universitaet Wuppertal) jrautenberg@uni-wuppertal.de)
Monitoring task leaders

Objective
(What is the science and/or engineering in this project? Why would it be interesting to work on it?)
Implementation of Data Quality (DQM) plots. Defining and applying procedures aimed at the monitoring of data quality for the surface and the fluorescence detector.

Prior Background
(What is the history of this topic, including previous project outcomes?)
The materials given in the references describe and document the monitoring program of the Pierre Auger Observatory. Additional and technical information are provided on the wiki pages (http://wiki.auger.org.ar/doku.php?id=monitoring:main)

Expectations
The individual or group undertaking this project is expected to manage scripts to analyze data from the Auger Monitoring. Some existing programs will be made available upon request. Progress reports and presentations at collaboration meetings are expected

Support
(Who will be directly interacting with the individual / group)
The monitoring task leaders will provide support for the individual / group to get started, and provide guidance when necessary. The work will be done in collaboration with the Operation and long term task leaders.

Resources needed and recommended skills
(What equipment, algorithms, and facilities should be available at the participating institutions.)
Access to Auger data. Knowledge of mysql, root and bash/php scripts would be helpful.

Technical References
(Identify a few key starting points; journal citations, prior reports, instruction manuals, etc.)
[1] **GAP 2010-103**
[2] The moniroting system of the Pierre Auger Observatory and its additional functionalities, J. Rautenberg for the Pierre Auger Coll., 31st ICRC 2009, Lodz, Poland

More Examples

Service task – Pierre Auger Observatory

Task: Hybrid performance, Operation and long-term performance

Project: **Hybrid Performance of the Pierre Auger Observatory**

Contact: L. Perrone (Università del Salento and INFN Lecce, lorenzo.perrone@le.infn.it)
Hybrid Detector performance task leader.

Objective
(What is the science and/or engineering in this project? Why would it be interesting to work on it?)
Derive and monitor the hybrid ontime and metrics as a function of time for all telescopes.
Rate of hybrid events as a function of time.
Status of the databases (FD Calibration and atmosphere for analysis)

Prior Background
(What is the history of this topic, including previous project outcomes?)
Add references.

Expectations
The individual or group undertaking this project is expected to manage scripts to analyze the data from the Auger Observatory. Use of Offline and ADST files recommended. Some basic analyses could also be done using monitoring data, which may be easier to get started for newcomers. Some existing programs will be made available upon request. Progress reports and presentations at collaboration meetings are expected

Support
(Who will be directly interacting with the individual / group)
The hybrid detector task leader will provide support for the individual / group to get started, and provide guidance when necessary. The work will be done in collaboration with the Operation and long term task leaders.

Resources needed and recommended skills
(What equipment, algorithms, and facilities should be available at the participating institutions)
Access to Auger data, including hybrid ontime root files , ADST files and monitoring data. Offline installation recommended.

Technical References
(Identify a few key starting points; journal citations, prior reports, instruction manuals, etc.)
[1]
[2]

Service task – Pierre Auger Observatory

Task: Monitoring

Project: **Data Quality using the Auger monitoring**

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Monitoring task leaders

Objective
(What is the science and/or engineering in this project? Why would it be interesting to work on it?)
Implementation of Data Quality (DQM) plots. Defining and applying procedures aimed at the monitoring of data quality for the surface and the fluorescence detector.

Prior Background
(What is the history of this topic, including previous project outcomes?)
The materials given in the references describe and document the monitoring program of the Pierre Auger Observatory. Additional and technical information are provided on the wiki pages (http://wiki.auger.org.ar/doku.php?id=monitoring:main)

Expectations
The individual or group undertaking this project is expected to manage scripts to analyze data from the Auger Monitoring. Some existing programs will be made available upon request. Progress reports and presentations at collaboration meetings are expected

Support
(Who will be directly interacting with the individual / group)
The monitoring task leaders will provide support for the individual / group to get started, and provide guidance when necessary. The work will be done in collaboration with the Operation and long term task leaders.

Resources needed and recommended skills
(What equipment, algorithms, and facilities should be available at the participating institutions.)
Access to Auger data. Knowledge of mysql, root and bash/php scripts would be helpful.

Technical References
(Identify a few key starting points; journal citations, prior reports, instruction manuals, etc.)
[1] **GAP 2010-103**
[2] The moniroting system of the Pierre Auger Observatory and its additional functionalities, J. Rautenberg for the Pierre Auger Coll., 31st ICRC 2009, Lodz, Poland

See Operation Session

Services tasks

Following input from task leaders

Atmospheric Analysis

Raman vs Std method cross-check
Add multiple scattering
Cloud cameras: analyze data
Set-up new DB server at CSM
Automatize the DB release

Calibrations

Time evolution (FD/SD/RD)
analysis of FD calibs during the night
"slice" the FD DB (shift-wise)
set-up a DB server
AERA software packages

Analysis Foundations

data and ADST production
data integrity and reconstructions comparison
SD and FD aging studies
GRID simulations

Long Term

Data Quality (DQM) plots (FD/SD/MD/RD)
FD shift reports (done)
Data preservation
Hybrid ontime and hybrid event rate
VEM evolution

Monitoring

Implementation of new software tools
Data Quality (DQM) plots (FD and SD)
Production of the root ontime files
Web interface

Atmospheric Analysis

Physics inspired
Raman vs standard method cross-checks
Revising the method for the selection of the reference night
Add simulation of multiple scattering
Cloud cameras: manage system analyze data

Technical
Testing database before release
Set-up new DB server at CSM
Automatize the DB release

Requirements
offline, mysql, php, python, bash, perl...

Calibrations

Physics inspired

Impact of FD calibrations continuously performed during the night
Time evolution of calibration constants (FD/RD/VEM evolution)
Monitoring FD/SD/RD calibration data quality
Analysis of FD data taken with large variances and lower gain

Technical

"Slice" the FD DB (shift-wise)
Set-up of a DB server
Set-up and maintaining of radio data streams
AERA software packages: - review of the analysis code (Offline)
- development in the EventBrowser (Offline)
- development of the Central DAQ real-time monitoring
- maintenance of the data streams (from Coihueco to Lyon)

Requirements

offline, mysql, php, python, bash, root, perl...

Monitoring

Data Quality (DQM) plots (see also Long Term)
CDAS integration
Maintenance
Web interface
Production of the hybrid ontime files

Requirements
mysql, php, python, root...

Long Term

Physics inspired
Data Quality (DQM) plots (see also Monitoring)
Hybrid ontime and event rate evolution
VEM evolution

Technical
Time evolution of trigger rate (SD, FD, RD, MD)
Time evolution of errors rate (SD, FD, RD, MD)
Data Preservation
Checking slow control data

Requirements
root, offline, mysql, php, python...

Foundations (preliminary)

Physics inspired
Test of data integrity and reconstructions comparison
Data and ADST production
SD and FD aging studies (see long term)
SD weather corrections
Cloud data analysis

Technical
GRID simulations
Muon detector event browser update

Requirements
offline, mysql, php, python, bash, perl...