



The Neutronmonitor Database Project



e-infrastructure

Report of the NMDB kick-off meeting



O. M. Rother A. Papaioannou C. T. Steigies

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Introduction

This is a report on the kick-off meeting of the FP7 project *Real-time database for high resolution Neutron Monitor measurements (NMDB)*, Grant agreement no.: 213007, organised by l'Observatoire de Paris. This meeting took place on 17-19 January, 2008 at the Observatoire de Paris in Meudon.

The purpose of this document is to present the objectives and main outcomes of the event. The structure of the document is the following:

- An overview of the event and its objectives, as well as information about attendance
- The collection of key messages from the speakers during the discussions of the work packages
- A summary of the action items identified during the first two days of the meeting
- A summary of the discussion in the splinter meeting of work packages 2 and 4
- A summary of the discussion in the splinter meeting of work package 5

Meeting Overview

The NMDB kick-off meeting was organised to coordinate the participation of all team members in the different work packages. The event focussed on the presentation of all work packages, the involvement of all groups, and how the participants of each work package cooperate to achieve the goals of our project. On the evening of January 16th, most participants met for informal talks before the official start of the kick-off meeting. Karl-Ludwig Klein welcomed the NMDB participants at the kickoff meeting on January 17th. After a brief introduction by the project coordinator, the meeting continued with three half-day sessions. In each of the three sessions two work packages were discussed in detail. The final day of the meeting was reserved for in-depth discussions in splinter groups, in particular WP2&4 (database), and WP5 (applications).

All presentations are collected on the kick-off page of the project:

<http://www.nmdb.info/ko>

List of attendants

Surname	Name	Organisation	Country
Bütikofer	Rolf	UBern	Switzerland
Dorman	Lev	TAU	Israel
Eroshenko	Eugenia	IZMIRAN	Russia
Flückiger	Erwin O.	UBern	Switzerland
Fuller	Nicolas	OBSParis	France
Geenen	Jos	BIRA	Belgium
Guillaume	Damien	OBSParis	France
Ibragimov	Askar	Oulu	Finland
Klein	Karl-Ludwig	OBSParis	France
Kryakunova	Olga	Almaty	Kazakhstan
Masson	Sophie	OBSParis	France
Mavromichalaki	Helen	NKUA	Greece
Papaioannou	Athanasios	NKUA	Greece
Parisi	Mario	URoma3	Italy
Rother	Oliver M.	CAU	Germany
Salarnis	Christos	NKUA	Greece
Stegen	Koen	BIRA	Belgium
Steigies	Christian T.	CAU	Germany
Storini	Marisa	IFSI-Roma/INAF	Italy
Usoskin	Ilya	Oulu	Finland
Yanke	Victor	IZMIRAN	Russia

Excused: Kosice, Armenia

1 Management of NMDB (WP1)

The first session was concerned with the management of the NMDB project. This work package has only a few deliverables, like preparing the meeting reports, which do need to be discussed in detail. However, other important things regarding the NMDB project are discussed here. <http://www.nmdb.info/ko/cau/steigies.pdf>

1.1 Deliverables

Work Package 1 has the following deliverables:

- meeting reports
- project website (Stegen: WP2, WP6)
- upgrade needs (Eroshenko, Mavromichalaki: WP4)

The preliminary version of the meeting report will be distributed at the end of January. The other deliverables of WP1 will be discussed in more detail in the respective Work Packages.

1.2 Financial Guidelines: timesheets

All participants have to follow the financial guidelines, which can be found on the website of the European Commission, a copy is available on the project website http://www.nmdb.info/management/financialguide_en.pdf

Some important issues that concern all participants are discussed here, for details everybody should read the complete guidelines.

- Only the costs of the actual hours worked by the persons directly carrying out work under the project may be charged. Working time is the total number of hours worked, excluding holidays, personal time, sick leave, or other allowances.
- Only the hours worked on the project can be charged. Working time to be charged must be recorded throughout the duration of the project by any reasonable means (e.g. timesheets). Employees have to record their time on a daily, weekly, or monthly basis using a paper or a computer-based system. The time-records have to be authorised by the project manager or other superior.

This means that all people working on the project have to fill in timesheets, samples provided by the german coordination office, and a reworked version by Uni Bern, are available on the kick-off page:

http://www.nmdb.info/ko/recording_hours_FP7.pdf

<http://www.nmdb.info/ko/TimesheetTemplateNMDB.xls>

<http://www.nmdb.info/ko/timesheetRP7.xls>

1.3 Financial Guidelines: durable equipment

Another important issue in the financial guidelines are the purchase costs of durable equipment:

- Only equipment purchased for the purposes of carrying out the action can be charged as direct costs. To be considered as eligible, a cost must be determined according to the beneficiary's usual accounting practice and each beneficiary must apply its usual depreciation system for durable equipment. Depreciation is charged in each relevant periodic report. Depreciated costs of equipment can never exceed the purchase price of the equipment.

The depreciation rules are different in different countries, so each participant needs to follow his national guidelines.

Taxes are non-reimbursable expenses, when you hand in receipts, only the net amount is reimbursable by the EC. Your administration will provide you with the necessary forms for the net amounts.

1.4 Midterm meeting

Several options for the date and location of the midterm meeting were discussed. Since all participants were in favour of having one project meeting in Kiel, and to probably meet for the final meeting again in Athens, it was decided that the midterm meeting should take place in Kiel. The midterm meeting should take place one year after the project has started, in December 2008 or January 2009. Due to various problems in late December/early January, the participants came to the conclusion that early December is the only available option for all participants. The dates December 3rd - 5th were accepted unanimously (10:0). The project is required to hold meetings every six months, so between kick-off, midterm, and final meeting two extra meetings have to take place. The meetings will be performed via telecon in June/July. Details for the telecon will be discussed later. Of course all work packages can have further meetings or telecons anytime it is necessary for the project to succeed.

1.5 Author list for project publications

The abstracts to present the project at the EGU meeting in March 2008 have very long author lists, we even have co-authors of groups that are not participants in the project.

It was suggested by A. Chilingarian that the project determines rules for the author lists of common presentations covering the whole project. Three options were proposed:

1. include only PI from each group
2. fixed number of leading scientists from each group + PI
3. relate number of participants according to real input in the project of every group.

After some discussion, the options boiled down to two, so a simple vote could be performed:

1. only PI from each group
2. PIs and all people who do the actual work

The outcome of the vote was: 7:2 for option 2 (**PIs and all people who do the actual work**). Absent groups: 3 (TAU, Aragats, Kosice). The PIs of each group define who are the people that do the actual work and have to send a list of co-authors to the coordinator, so that they can be credited properly in all future presentations and publications that cover the whole project. Publications which discuss one work package, or part thereof, are not covered by this decision, the list of co-authors is to be freely decided by the collaborators. The current author list for the NMDB team is available at <http://www.nmdb.info/team/>

1.6 Conferences

Besides the EGU meeting, there are several other conferences which might be of interest for the project:

- AOGS 2008 16-20 June 2008
- COSPAR 2008, Montreal July 13-20 2008
- ECRS 2008, Kosice 9-12 September 2008

Further information and abstracts already submitted to conferences are collected on the website: <http://www.nmdb.info/presentations/>

1.7 Project website

The Commission has asked us to register a `dot.eu` domain for the project, K. Stegen is investigating to acquire `nmdb.eu` for the project. Until then we use <http://www.nmdb.info> as preliminary website. It is possible to use subdomains or email addresses to forward them to the participants of NMDB. This offer also holds for `neutronmonitor.net`, which has also been registered by the Project Coordinator.

1.8 Legal documents

The Accession forms of all participants have arrived in Kiel and have been countersigned by the University. The signed forms are distributed, together with the missing consortium agreement signature page from TAU, to all participants present. The forms for Kosice and Aragats will be sent by mail.

2 Architectural design of the database (WP2)

2.1 BIRA-IASB

K. Stegen presents the concept of the database architecture for NMDB. The project will set up three mirrors of the central database at BIRA: NKUA, CAU, IZMIRAN. Those institutes will run servers which replicate their data to the central Brussels server and to the three other servers. Other database servers will replicate their databases from Brussels.

Database mirror scenarios:

- asynchronous master-slave
- asynchronous multi-master
- synchronous master-slave
- synchronous multi-master

Master-slave operation is not an option. If the master fails, all slaves are in an unclear state.

Synchronous multi-master is a “dream”: time sync, identical datasets on all mirrors at every time. But if any of the masters fail, no one of the other databases is authorised to give an answer.

Asynchronous multi-master mode is achievable.

Database software is hardware-independent. Guidelines for server setup will be included in the documentation.

Timeline

- 3 months: Prototype server in Brussels, setup documentation for mirror servers
- 6 months: Documentation part II
- 12 months: final database, final documentation

2.2 IZMIRAN

IZMIRAN has a long history of collecting and distributing data from a wide variety of neutron monitor stations. Their expertise will help prevent flaws in the early design stages. IZMIRAN will set up a mirror of the database (January - August 2008) and check their existing archive of station metadata (correction coefficients, dates of changes in registration electronics, data formats, etc.). They will support BIRA with importing the existing archive of neutron monitor measurements into NMDB. IZMIRAN has developed quality control algorithms for neutron monitor measurements and offers support to all stations, that might need support with quality control of their data. IZMIRAN has already performed calculations of cosmic ray parameters, which can be used as a starting point for the project. Links to these calculations of Anisotropy parameters <http://cr20.izmiran.ru/AnisotropyCR/> and related calculations shall be included in the NMDB website.

E. Eroshenko suggests an “Expert mode” for the database which would hide uncorrected/unclear data from “normal” users. For database synchronisation IZMIRAN suggests a pull-model to prevent data gaps in case of network failures. She also suggests to contact stations, which are not part of this project, to define a standard format for high-resolution measurements. Several stations are providing data with 1-minute resolution or better, but each station has created their own data format, which makes automatic processing of the data difficult. UNIROMA3 comments that the NM data in the NMDB will be organised following the format decided by the NMDB Consortium, but on the portal website of the each station normalised data, which is easily usable for anybody, can still be used.

2.3 NKUA

NKUA needs to start working with a database immediately (inserts, synchronisation). Therefore, the table structure needs to be discussed, and NKUA will support BIRA with this task. Some columns of the database, like “quality flag”, “version flag”, and “corrected data” need to be defined/discussed (corrected only for pressure, or geometry, ...?). UNIROMA3 comments that one single quality flag is not sufficient, and suggests a “caveat file”. CAU comments that the table structure has been discussed previously in Athens, and the outcome of this discussion should be used for the prototype database. The findings from the trial phase will help with the definition of the final database format.

To supply the measurements to the database, a push model is favoured. All participants are asked if they are ready to run a database import script?

- IZMIRAN: yes
- TAU: yes (IZMIRAN system, DOS, Pascal, Windows server). IZMIRAN will help with pleasure.
- ALMATY: yes

- OULU: yes
- UNIROMA3: needs administrative clearance
- UBERN: yes
- CAU: yes
- OBSPARIS: yes (but not realtime by now): will be asked by e-mail [NKUA]
- Kosice: will be asked by e-mail [NKUA]

Mirroring of the database will be discussed later.

3 Guidelines for data acquisition (WP3)

3.1 NKUA

C. Salarnis presents the NKUA contribution to WP3. WP3 consists of three phases: the archive creation, the trial period, and the design of the prototype of the new standard registration system.

NKUA is creating an online questionnaire, which all participating stations need to fill in. The participants can add questions they deem necessary to the questionnaire. The following comments came up during the presentation:

- UNIROMA3: Station ID has to be at least 5 chars. “Head organisation” does not work for UNIROMA3 because they are a collaborative.
- CAU: Does “Head organisation” not mean “Kiel University” or “Paris University”, which means, an institution, not a person?
- TAU: Primary contact should not necessarily be PI
- OULU: Why ask for floor thickness. Was “roof” the intended question?
- UBERN: We should ask explicitly for thickness in mass units, not in meters.
- IZMIRAN/CAU: Average atmospheric pressure coefficient must be changed to “Standard/average atmospheric pressure”
- UNIROMA3: Why do we ask for Type of Preamplifier?
- OULU: “Acquisition system” instead of “Registration system”
- CAU: “Data resolution” should be renamed to “Data acquisition rate”
- UBERN/CAU/OULU: “Data quality checking” is unclear
- OULU/OBSPARIS: “describe part and designer” should be “indicate part and designer”
- OBSPARIS: “hardware free available” is misleading
- OBSPARIS: Change “Sharing your data with” to “providing your data to”

The time window for filling out the questionnaire: two weeks (month 3.4–5)
The second phase consists of software updates, the trial period, and stations sending data to the preliminary db (month 6-12) To provide neutron monitor measurements with 1-minute resolution and low latency to the database, most stations need to perform hard- and/or software upgrades. The specifications for the upgrades will be agreed upon, and each station must declare its ability to perform the necessary upgrades on their own. The stations that are not yet ready to send data minutely are: NKUA, CAU, OBSPARIS, Kosice. CAU comments that the tracking of the Questionnaire history could be useful, in case of station upgrades, changes in the cut-off parameters,
During phase 3 the prototype specifications and design will be developed. The specification discussions will take place during month 13–14. Groups helping this task besides IZMIRAN, NKUA, and CAU will be Aragats. The development and implementation of the registration system will be during months 15–18, and the documentation will be prepared in months 19–21. A conclusion of these discussions is, that most stations must be able to do db inserts to the end of year one.

3.2 Aragats (presented by Steigies)

C. Steigies presents the contribution for WP3 on behalf of Aragats:

<http://www.nmdb.info/ko/Aragats>

Aragats is already upgrading their systems and will finish the upgrades in Summer 2008. Aragats is also implementing a prototype registration system, delivery date is 18 months after project start.

3.3 IZMIRAN

E. Eroshenko presents the deliverables of WP3 (<http://www.nmdb.info/ko/izmiran>). A questionnaire about the status of all Neutron Monitors has been created and distributed. Stations that only need a software upgrade to be able to provide 1-minute data have been identified. ALMATY and NKUA only need a db insert script. Apatity, OULU, Barentsburg need to convert 10s data to 1-min data and a db insert script. The preparation of the necessary software upgrades is in progress. To complete this task, the test version of NMDB has to be accessible. Some stations have been identified that need a hardware upgrade before they can deliver reliable 1-min resolution data. Barentsburg and Norilsk will need new pressure sensors. The status of Aragats needs to be inquired. The stations in Kerguelen and Terre Adelie need a complete new setup, which seems to be possible. OBSParis comments that one minute data is available, but that there will be no realtime db insert from Terre Adelie. For Kerguelen it should be possible to the end of the year.

Another goal of the project is to develop a new “standard” registration system, that can deliver high resolution data in near-realtime but is still affordable. Tests of several prototypes are being performed in the following months. Windows software is available

for a relatively cheap industrial standard measurement card (Advantech), software for Linux is being developed.

Finally, a website documenting all hard- and software will be created by the end of the project.

4 User tools (WP4)

4.1 BIRA-IASB

K. Stegen clarifies the meaning of User Tools again. User tools are NOT applications! The "user" is that party which connects directly to the data base, in most cases this will be not a person, but an application. An application from WP5 is the user using a user tool from WP4. Applications are e.g. programs which calculate dose rates for air crews. User tools help to get the information out of the database, but they do NOT calculate dose rates etc. User tools are mainly SQL (Structured Query Language) database queries. SQL queries are included in your program's programming language source code (THAT would be the application!)

User tools and documentation will be stable at 12 months after the project starts, first versions will be available 3 to 4 months after the project starts.

4.2 Aragats (presented by Steigies)

"user tools for peak searching, comparing time series..." This seems to be an application (work with the data), but not a user tool as defined by NMDB. If it is an application, this activity belongs into work package 5, not in work package 4. Further discussion revealed that this could indeed be a user tool, if the peak searching algorithm is given as an example for using the database tools to gather peak information with database queries. In any case, this contribution needs to be discussed further with the work package leaders, and the contribution of Aragats for work package 4 needs to be defined.

5 Applications / service (WP5)

All beneficiaries of WP5 report on their contribution to this work package.

5.1 report by IZMIRAN

E. Eroshenko present the deliverables of WP5.

The groups in IZMIRAN, NKUA, Almaty, Kosice, UBERN, Aragats, and TAU are working on an automated GLE and SNE (solar neutron enhancement) alert system. IZMIRAN suggests to install it “on the central database”. CAU comments that we should not install other software on the database servers, but that there can be application servers near to a database server to do the job. Belgium and Athens agree to this approach.

Real time modeling of GLE will be performed by NKUA, IZMIRAN, and TAU and will be delivered in month 18.

UBern and NKUA are working on GLE intensity mapping, the results will be delivered in three stages in months 5, 12, and 24.

IZMIRAN, NKUA, Kosice, and TAU are working on Hourly CR variations including pitch angle and longitude distributions, and will deliver in month 18. IZMIRAN, NKUA, and Almaty are working on Deriving the CR parameters at the top of Magnetosphere from real time data, and will deliver in month 20.

Rigidity spectra of CR variations by daily and monthly NM data are calculated by IZMIRAN, Kosice, Almaty, and TAU, and will deliver in month 20.

CR fluctuations on short time scales (1-15 min) are computed by UNIROMA3 - DIP FIS, Kosice, and Almaty), and will deliver in month 21.

All participants will work on a documentation library of all applications and input-output information (delivery in month 23). CAU comment on the Alert System, that standard formats/procedures for virtual observatories should be followed.

It is suggested to plan an extra day after or before the ECRS conference in Kosice, since most participants will be in Kosice. This meeting can be used as a status report before the mid-term meeting.

5.2 report by Aragats (presented by Steigies)

C. Steigies presents to Aragats contribution to WP5. Aragats will specifically work on the GLE ALERT systems and on algorithms to detect solar neutrons. Some of their contributions have already been presented by E. Eroshenko. However, CAU comments

that IZMIRAN as the WP leader should closely cooperate with Aragats to ensure that their contributions will be a success.

5.3 report by UBERN

R. Buetikofer presents the detailed approach of their use of the CR flux outside the geomagnetosphere (provided by NMDB) to compute the CR flux at the top of the atmosphere, as well as of ionisation and effective dose rates in Earth's atmosphere:

<http://www.nmdb.info/ko/UBern>

These calculations will be performed with the Geant4 codes PLANETOCOSMICS and MAGNETOCOSMICS, that have been developed in Bern.

5.4 report by ALMATY

O. Kryakunova presents the status of the Almaty Neutron Monitor station:

<http://www.nmdb.info/ko/Almaty>

She details the Almaty contribution to the GLE ALERT system, and highlights the importance of high-mountain stations, like Almaty, to the detection of solar neutrons. She also proposes to use cosmic ray indices to investigate space weather disturbances in real-time. CAU ask how the calculation of CR activity indices occurs? O. Kryakunova replies that they just calculate them from the NMDB data. BIRA comments that at some point additional data (indexes, etc) should not be mirrored on all the mirror servers for performance reasons.

5.5 report by TAU

L. Dorman reports the status of the Israel Neutron Monitor. He suggest to measure the atmospheric electric field measurements and to combine myon telescope data with NM data.

5.6 report by NKUA

A. Papaioannou presents the NKUA implementation of a real-time GLE alert (NM-BANGLE): <http://www.nmdb.info/ko/nkua>

NKUA is working on a real-time version of their ALERT system, real-time NM-BANGLE will be available online in month 18. He presents the detailed steps of calculating all parameters necessary for the NM-BANGLE model and the CR indices that can be derived from the model.

6 Training & dissemination (WP6)

6.1 OBSPARIS

K.-L. Klein presents the deliverables of WP6:

<http://www.nmdb.info/ko/OBSParis/>

In a first step, an inventory of existing training online manuals and websites will be created by NKUA and TAU. In a second step, OBSParis will create a list of subjects, assign writing tasks, and define the characteristics and format of the web-based tutorials. As an example, D. Guillaume presents the e-learning activities of the Observatoire de Paris. He is presenting several webpages as well as the editor (Jaxe: Java Advanced XML Editor, jaxe.sf.net that can be used to create such e-learning websites. In the third step, the existing material will be adapted and new tutorials will be written by CAU, IZMIRAN, OBSParis, NKUA, Aragats, Almaty, and TAU. TAU and Aragats will develop research projects for high-schools, early and advanced University level in the fourth step. In the fifth step, background information on the calculation of cosmic ray parameters (UBern) and Ground-Level-Event analysis (IZMIRAN) will be prepared. Finally, a training website, which implements all the tutorials and projects, that have been developed, will be set up by OBSParis, and a training course will be organised by CAU.

6.2 BIRA-IASB

K. Stegen introduces www.spaceweather.eu, which is based on the same technology (drupal) as what will be used for the NMDB project website. The European Spaceweather portal is developed and hosted by BIRA, this experience is very useful for NMDB. The website supports many languages, translations and contents of the website can be supplied by registered users.

6.3 TAU

L. Dorman discusses the e-learning activities of TAU/ICRC. They have a good experience in translating several international e-learning websites into Hebrew. He will make an overview of the websites, web addresses, and further details on their experience with e-learning activities available to WP6.

7 Miscellaneous

7.1 Action items

In the first two days of the kick-off meeting several action items were discovered. The following is a list of the most urgent action items, showing the partners responsible for the action item in brackets. <http://www.nmdb.info/ko/cau/ai.pdf>

7.1.1 by KIEL

- fill in station questionnaire [all]
- deliverables are top priority [all]
- list of people for project presentations ("The NMDB Team") [all]
- meeting report [CAU]
- invitation letter for data providers (New Hampshire, Mexico, South Africa (more?)) [CAU], (Tibet) [UBERN], (Bartol) [IZMIRAN]
- New Hampshire historical data [CAU]
- Rome historical data [UNIROMA3] – For the historical 15-minute data (before 1997) recorded by the Rome NM it is necessary to prepare an inventory with the data type and data conservation support (paper, film, card, magnetic tape, ...). This inventory will be completed within May 2008 with an estimation of the cost for the digital conversion. Moreover, M. Parisi will write to the involved Institutions (Rome La Sapienza University/Dept. of Physics and CNR/IFSI) informing on the inclusion of the Rome NM historical data in NMDB. Rome says, the data from 1997 until today will go into the database. Rome will discuss the problem regarding the historical data with their founders. The historical data will need preparation, which has to be supported by SVIRCO(?). M. Parisi will write a request letter to SVIRCO to get permission and support to include the historical data from the Rome NM in NMDB
- Support letter for Bartols [NKUA?]. NKUA sent out support letters and will report.
- training inventory [NKUA, TAU]
- project website and test database [BIRA]

- one day NMDB meeting one day after ECRS [IZMIRAN]
- man-month discrepancy in WP5 [CAU, IZMIRAN, UBERN]

7.1.2 by BIRA-IASB

- detailed server hardware specifications for NKUA and IZMIRAN [CAU]
- buy two servers specified by CAU, send one to IZMIRAN [NKUA]
- clarification of column definitions: “original counts”, “counts corrected for efficiency” [BIRA-IASB]
- include official “quality flag” [BIRA-IASB]

7.2 Location and time of the end-term meeting and the training course, outlook

The final meeting could be held in early December 2009. The decision about the location and exact time is postponed to the mid-term meeting in Kiel.

The training course will be held in November 2009. It might be independent to final meeting, but it could take place in conjunction with the final meeting.

K.-L. Klein suggest to apply for an ISSI 2009 workshop. UBERN comments that we could apply, but the chances for success are poor. OBSPARIS recognises the problem that we have no “spacecraft data”.

CAU suggests that additional WP5 and WP6 meetings are being held, since these packages require the most coordination. CAU also suggests, that during the mid-term meeting it should be discussed if the participants want to apply for a follow-up project.

8 Splinter meetings

8.1 WP2/WP4 (by O. Rother, CAU)

Detailed discussion of database server specifications (hardware and software):

- INTEL server mainboard
- INTEL dual core CPU
- 2 GB+ RAM
- 4× 750–1000 GB hard disks, software RAID 5
- Debian Linux 4.0 (Etch)

BIRA-IASB introduces “slony”, an add-on software package for postgresql multi-master replication

Action items See 7.1.2

8.2 WP5/WP6 (by A. Papaioannou, NKUA)

WP5a. Discussion on the deliverables initiated by E. Eroshenko. The first del. is 5.1 (GLE Alert system). H. Mavromichalaki said that NKUA already has a reliable Alert working on a local database at Athens. The first step to this direction of having an Alert on the NMDB is for each group to run each available Alert program (by NKUA, TAU, IZMIRAN, Aragats) by themselves and try to see the performance. E. Eroshenko proposed to provide short term data (1-min or 5-min data), and also each group should provide versioning of the development. This means that every group will run their Alert for 2 stations (that should stand for version 1); 5 stations (version 2) and so on.

E. Flueckiger asked if at the end there will be 1 alert program or more. E. Eroshenko replied that this will be decided during the development period. 1 maybe 2 Alert systems will be delivered.

IZMIRAN will provide as input 1-min data from 1984–1991 to every group. Each group is obliged to run their software at this data for 3 months and contact back IZMIRAN with their results.

Contact Kosice, Aragats in order to inform them on the outcome of this discussion. Kosice will start working later on. They will have to check by their mountain station (LMKS) the Alert. The idea is to have 2 Alerts. One working on the all data from the NMDB, and one working on only high mountain station (high latitude stations).

5.2 (real time modeling on GLE). H. Mavromichalaki said that NM-BANGLE from the Athens group will be set in real-time in the next months by Matlab. E. Eroshenko suggested that NM-BANGLE should be simplified in order to provide faster analysis. The results needed must include: gamma, anisotropy — whatever UBERN needs as an input. H. Mavromichalaki together with A. Papaioannou proposed not to simplify NM-BANGLE but instead to try to elaborate an executable from Matlab source code and test it in historical data at “real-time” mode at their local 1-min database at Athens. E. Flueckiger comments that this is perfect. The result is that NKUA, IZMIRAN & TAU will have to try their approaches and provide their results internally. A report must be ready on September 2008 (for the meeting of NMDB under ECRS at Kosice).

5.3.1–5.3.3 The deliverables will be made by UBERN with the assistance of IZMIRAN (galactic cosmic rays) and NKUA (solar cosmic rays). The first deliverable (5.3.1) has to be carried out until end of April 2008.

5.4.1 Hourly CR variations: Computation of galactic cosmic ray intensity and anisotropy variation by IZMIRAN and NKUA. L. Dorman proposed to elaborate an automated program for pitch angle distribution. This should be finished also by September 2008.

5.4.2 This is the most labour consuming part. This item refers to galactic cosmic rays. At this point there is a more or less a good version of the Global Survey Method (GSM) which can be used. The task is to adjust this algorithm in real-time mode. This has been tested by IZMIRAN already. There are issues that need to be resolved. The results of the GSM should be further investigated, although it seems possible to derive GSM in real-time. The deliverable is to elaborate an automated version of GSM. There are two tasks on this issue. One is to have good data that would not “crash” the GSM software. The other is to know if there are abrupt changes in the IMF.

M. Parisi asked E. Eroshenko if this method takes into account coupling coefficients and which, E. Eroshenko responded that they use the last calculated. This is an input at their server for the calculations.

IZMIRAN will elaborate the automated version for GSM program

NKUA will help with this attempt

ALMATY will check and verify data from previous period and will provide real-time current data

TAU will verify and check all coupling coefficients for all stations by May 2008

5.5 del. This task may be realized promptly. For the first step data from several stations (entering NMDB) would be enough (Moscow, Lomnický štít, Rome, Almaty). Input: Hourly NM data from several stations Output: rigidity spectra of galactic CR variations which are necessary for 5.3 items. Develop of software for “pushing” the results to NMDB or to server UBERN. The first results may be obtain by June 2008.

5.6 del. Input data: one-minute data from 3-5 high latitude NMs, and low latitude NMs with high statistics, such as Almaty and, if possible, Tibet. Output data: Wavelet spectrum and power spectrum of CR density over periodicities 2 hours – 11 years. Time series of neutron monitor at Lomnický štít for the period 1982-2007 will be checked for stability and simultaneous variability as measured by individual tubes and sections of NM (with F. Skorsepa and R. Langer). M. Parisi proposed to perform comprehensive analysis of CR events. The idea is to select particular events in the “past” characterised by various parameters and track the shock depositing at Earth and elaborate different filters to check this. Preliminary results should be available by September 2008 also.

5.7 Creation of the library.

Every participant should have a report on their working progress by September 2008.

A List of attendants

List of Attendants

Name	Institute	Thursday, 17.01.08	Friday, 18.01.08	Saturday, 19.01.08
Socijics	CAU	<i>Socijics</i>	<i>Socijics</i>	<i>Socijics</i>
Rother	CAU	<i>O.R.</i>	<i>O.R.</i>	<i>O.R.</i>
Kudela	Kosice			
Usoskin	Onlu	<i>Usoskin</i>	<i>Usoskin</i>	<i>Usoskin</i>
Ibragimov	Onlu			
Flückiger	UBern	<i>Flückiger</i>	<i>Flückiger</i>	<i>Flückiger</i>
Bütikoler	UBern	<i>R. Bütikoler</i>	<i>R. Bütikoler</i>	<i>R. Bütikoler</i>
Stegen	BIRA	<i>Stegen</i>	<i>Stegen</i>	<i>Stegen</i>
GEEUW	Bira			
Eroshenko	IZMIRAN	<i>Eroshenko</i>	<i>Eroshenko</i>	<i>Eroshenko</i>
Yanke	IZMIRAN			
Klein	OBSParis	<i>Klein</i>	<i>Klein</i>	<i>Klein</i>
Fuller	OBSParis	<i>Fuller</i>	<i>Fuller</i>	<i>Fuller</i>
WILLIAMS	OBSParis	<i>Williams</i>	<i>Williams</i>	<i>Williams</i>
GUILLAUME	OBSParis			
Mavromichalaki	NKUA	<i>Mavromichalaki</i>	<i>Mavromichalaki</i>	<i>Mavromichalaki</i>
Salarnis	NKUA	<i>Salarnis</i>	<i>Salarnis</i>	<i>Salarnis</i>
Papaioannou	NKUA	<i>Papaioannou</i>	<i>Papaioannou</i>	<i>Papaioannou</i>
Chilingaryan	Aragats			
Parisi	URoma3	<i>Parisi</i>	<i>Parisi</i>	<i>Parisi</i>
Storini	URoma3			
Kryakunova	Almaty	<i>Kryakunova</i>	<i>Kryakunova</i>	<i>Kryakunova</i>
Dorman	TAU	<i>Dorman</i>	<i>Dorman</i>	<i>Dorman</i>
Pustil'nik	TAU			