Geotechnologien-Projekt EXUPÉRY

– KOORDINATOREN: TORSTEN DAHM, MATTHIAS HORT, JOACHIM WASSERMANN –

Summary of 3rd Exupéry Workshop in Hannover Jun. 29–30th, 2009

Participants (from north to south):

Thor Hansteen, Klemen Zaksek, Lars Krieger, Matthias Hort, Manocheer Shirzaei, Conny Hammer, Hans Peter Stittgen, Klaus Stammler, Stefan Bernsdorf, Carl Gerstenecker, Gwendolyn Läufer, Cordelia Maerker, Pieter Valks, Xiaoying Cong, Moritz Beyreuther.

Brief review of the field campaign

The field campaign was successful. All seismometers were installed but there are still problems with the WLAN mesh network amongst the stations installed at Sete Cidades. The installation of the IBIS system was successful too, but there are problems with the power supply (seems it always rains on the Azores….). Due to power problems and a very difficult terrain only half of the dual frequency receivers were installed by the Darmstadt group. The Darmstadt group also installed 3 single-frequency receivers and 4 corner reflectors.
The Group from the DLR in Munich successfully installed two corner reflectors for the PSIn experiment..
We still have problems with the wireless network (e.g. Gwendolyn pointed out that there is too much traffic (WLAN and other communication) at their repeater at location Barrosa). Currently no data are coming in from the geodetic network due to power problems (too much rain), and some power connections were partially flooded. The repeater 2 of the seismological network part has been moved by Arturo and now a stable connection is established and station 1 is finally coming in continuously. There is still a problem with connection to the hotel repeater. Arturo is trying to get permission to move the repeater to another site. This appears to be difficult.

Status of different work packages:

<u>WP1 (Läufer)</u>

Wireless network did not work at all during the April campaign. During 2nd campaign in early June wireless network was installed again. It worked for a while, but due to power problems the connection is currently not working. There is simply not enough sun on that part of the island…. The data will be analysed after retrieving the instruments from Azores.

GIS interface:

- Coherence image is not transparent.
- Info box for the displacement images. What is needed is the extract from the XML File, e.g.. the time difference between the images that have been used for the displacement calculation

- Display of time histories is unclear; deformations over longer period will be most likely computed on demand only (this probably has to be done manually).

WP1 (Hansteen)

No real field test (no SO2 observed on Azores) except checking if data transfer via FTP works. Data should for security reasons enter through HTTP protocol, which will be accomplished through an improved protocol in October.

GIS interface:

- Currently no data in GIS. Send some sample files for testing.
- The XML file must contain more extensive information; additional tags need first to be defined.
- Clicking on the time series brings up a layer which will give a link to a download window for access to the ASCII file that contains the original data.
- For hourly and daily fluxes one needs to average over the fluxes which are stored in the XML data file. How this can be done is unclear, this needs to be solved!

WP2 (Cordelia Maerker)

Probably the most advanced task in terms of data processing and display capabilities in the GIS.

GIS interface:

- Infos for the whole image are required, unclear how to display them. Info button is currently for extracting the value of one pixel from the image. Stefan will most likely add another button on the layer control.
- Problem with trajectory data probabilities, wrong colours, preserve only height style.
- Inclusion of additional images. Additional images would mean a new layer. XML file and whole other info is needed. Those images need to be defined so the layers can be implemented.
- New project (Etna) was proposed to be opened for additional testing of WP2.
- Alert levels are done by Moritz (WP3).

WP2 (Cong)

Data processing is well advanced. The data are manually transferred to the server.

GIS interface:

- Certain style for the coherence transparency display, only data with high coherency should be displayed. Possible solution: Provide images with 0.5, 0.7 coherence values only being displayed. This is provided as a separate image.
- Problem with the KML file, most likely easy to fix.
- PSI Data should work but it needs to be tested.

WP2 (Zaksek)

Data processing is operational. About 4 images per day.

GIS interface:

- Thermal images. 16 bit images does not function yet.
- Note somewhere (the best in the GIS metadata that open each time you add layer) that the colours of the images are not the same in each image. Otherwise this may lead to confusion.

WP3 (Stittgen)

H.P. showed how one can extract information directly out of the SeisHub data base. It can be accessed through: http://193.174.161.15:8080/manage (UN: guest, PS: exupery-vfrs). Data can be added to the data base manually using this interface. Mappers are written in Python, pass data from SeisHub to the GIS interface. Question, if someone logs on, can he also delete data from the data base? This should only be allowed in a special modus to avoid destruction of the data base.

GIS interface for seismic data

- Functionality was checked. Generally looks good, but some important details are still missing:
  - data quality not yet shown,
  - station information does not work,
  - styles for seismic events are not yet implemented.
- Beach Balls are implemented. Which information out of the XML-file should be displayed? This needs to be defined (see WP5).
- Filter for seismic events: maybe not necessary because there is a colour scale for event types.
- Seismic events: the attributes that are suggested by Joachim (we know it is difficult to implement but necessary) are necessary. Need to be implemented.
- Display time quality, data gaps, overlaps and how they evolve.

WP3 (Beyreuther)

Work is progressing well with the determination of alert levels.

GIS interface:

- Through java script direct access to Bayesian network in order to access the different probabilities. User can change the weights of the different input streams and can see how the actual alert level was computed. Nothing of this in implemented as of yet so this need to be checked thoroughly.

WP5 (Hammer)

The current system on the Azores is running at 2 regular detection systems (seiscomp and earthworm). Connies algorithm only detects events and does not localize them but,

importantly, classifies them. System has to make a decision which events detected by the different system are the same. This could be done by a mapper or viewer but is not implemented yet and will be done by H.-P- Stittgen

Each detection system gets a prescribed priority so the detection from the system with the highest priority (chosen before) is displayed (e.g. as earthworm allows a for a local velocity model locations are better than the ones from seiscomp3). In case only Connies system detects an event which is not found by the other systems the information about this event is only displayed in event statistics as there is no location associated with it.

GIS interface for seismic data

- Display of the different events needs to be checked. (colour coding scheme needs to be determined)
- In case an location is associated to the event it is displayed in the GIS via a colour coding scheme.
- Event statistics will be provided to display number of events in an interactively chosen time range the mapper is already done by S. Bernsdorf.

WP5 (Krieger)

Lars had many things to organize for the ship/land experiment. The inversion software is in progress but not yet working in near real time mode. In order to proceed, Lars needs Greens functions. These are calculated not by Lars. He will travel to Potsdam where seismic data for Merapi are available and then to Munich where he will get the Greens functions for Mearpi too, Joachim, please assist him.

GIS interface:

- XML scheme is ok.
- Robert wrote a script that will show the beach balls as PNG in the web GIS interface.

WP5 (Shirzaei)

Deformation needs user interaction – manually add information about the model. So far unclear how this could be done. Maybe the same way as Mortiz displays his network data for user interaction.

GIS Interface:

- How can we provide time series information of the 2D deformation. This is important information, solution unclear up to now. Maybe through an AVI which is generated by the software and then called via a URL which is displayed in the info box.

General problem with speed of the data base

Whole data base is scanned for information for a certain filter. With a growing amount of data this takes more and more time. It was proposed to compress the data. This is especially a problem with the large GOME pictures. Pieter Valks will try to downsample the picture once again, so searching is faster.

Final note: We would like to thank the BGR very much for hosting the meeting and Klaus Stammler and Hans Peter Stittgen for the organization!

General issues (concern all Exupéry participants!)

Software manuals

A manual for the software needs to be written. This is part of the product we have to deliver at the end of the project. The manual for the GIS interface, e.g. for each layer is written by the different people involved in the work packages. It was agreed that the manual will be provided in form of a wiki. We will provide a general layout until the end of August and this is then used by the different people for their part of the interface.

We need also installation manuals: for the GIS interface this has to be provided by Stefan Bernsdorf. He also needs to provide the information about his software.

The installation manual for seishub comes from Stittgen/Barsch.

How to use the mesh system comes from Montalvo/Hort/Beyreuter

What is needed for Geotechnologien status seminar

For the upcoming status seminar (October 12–13, see mail form the Geotechnologien Büro from June 18th for details) we need a 2 page report from each work package. As we need to bind everything the coordinators for the different WP (1: Gerstenecker, 2: Zaksek, 3: Wassermann, 4: Hort, 5: Dahm) are asked to send their final versions back to Klemen by **August 20th**. Please use the by Geotechnologien Büro provided template and cover the aspect that are interested for the project evaluators (all listed in the mentioned mail from Geotechnologien).

Meeting in Darmstadt (November 23rd–24th) for GIS interface

In order to make sure that the GIS system has the functionality we need, everyone **HAS** to make sure that his layers are shown with the required functions. As we need to finish the GIS interface by the end of the year a last meeting will be hold in late November in Darmstadt to once again check the functions. This is the final meeting for the GIS system then.

Publications

We need to update the list of all publications related to Exupéry project. Thus we put the old list on the Exupéry web site http://www.exupery-vfrs.de/Publications.633.0.html. This information is important for the project evaluators, thus please update your publication list by sending an Email to Klemen.

Removal of all equipment from the Azores

Hamburg group will arrive in Ponta Delgada on Aug. 26. First setup of 9 additional short period instruments will take place, then recording of the shots from the Meteor, afterwards removal of all instruments from the island. Container has to be packed by Sept. 15th, so it can be moved back to Germany.