UserGuide

Version 1.1

by

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1 Requirements

SplitLab should run on every computer system (MS Windows, MAC, Linux, SUN) with **Matlab7.0** or higher, the **Mapping toolbox** and the **Signal Processing** toolbox.

For information on MatLab please visit the homepage:

http://www.mathworks.com

2 License

SplitLab is PostCard ware! If you like it, please send a Postcard of the place you live to:

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Or, simply send an email with a nice photo (your town, institute, famous landmark, pet,…) to splitlab@gmx.net.

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3 Bug report

If you think you found a bug, don't hesitate and write an email to splitlab@gmx.net. Please include the project file and the 3 SAC files in your email. This simplifies the search for the bug. Please also copy and paste the complete error message in the email, i.e. everything, that Matlab outputs in red...

In general, any comments are welcome, especially positive ones:-)

4 Suggestions

Please report wishes for additional features or any changes in the source codes to splitlab@gmx.net. This helps every user and allows for the maximum functionality for every user.

5 Installation

After unzipping the SplitLab package, put the SplitLab directory at your favorite place

Start Matlab

- In Matlab, go in the SplitLab directory
- The installation of SplitLab is made by running the macro. In the Matlab command line type "`>> install_SplitLab`". This macro does several things:
  - it installs the matTaup package as a Matlab toolbox in the Matlab directories. matTaup is a Java program that allows the calculation of the travel times, of the hodochrons, and of the ray path through the Earth.
  - it also installs in the SplitLab directory the event catalog files, such as the NEIC epicenter locations and the Harvard Centroid Moment Tensor (CMT). Either file is used in the following processes for the event selection and to create the virtual link between the seismograms and the events.
- Restart Matlab

Perhaps Troubleshooting helps case of problems

6 Running SplitLab

In the Matlab environment, type in the command line "`>> splitlab`". It opens the "*Configure SplitLab*" window that will allow you to prepare your project, i.e. your data selection, your data request, and to build your seismic database that will allow you to manage easily data and results in the processes of shear wave splitting measurements.

What is a SplitLab project? A project can be defined as a set of seismic data associated to a set of events derived from a given selection. Any given project concerns a single station since the selection of data is performed from station-events epicentral distances. A project is generally related to a directory where data are stored. A given project may concern only part of seismic data in the directory and alternatively, several projects may coexist in a given directory where data are stored: a first project may be focused on SKS splitting measurements, a second on P-wave analyses, etc.

In order to have the project OK and operational, one has to follow the six steps presented on the left-hand side of the "configure" window:

General → Station → Event → Request → Phases → Find Files.

7 New in Version 1.1

- Introduced P-wave arrival pick (right mouse-button click). Stored in the two element vector eq.Ppick The S-Window is as usual selected by the left mouse button.
- The S-pick time is now stored in the two element vector eq.Spick
- Shift-click (left or right) chooses the Zoom window. Press BackSpace to Zoom-Out.
- Allow the number of poles of a filter to be selected. This is accessible via the filter dialog, if you press "f" in the SeismoViewer. Value stored as third element of eq.filter
- New "Zoom" and "Pan" behaviour of the SeismoViewer using the keyboard:

→	Pan right
←	Pan left
↑	Zoom in
↓	Zoom out
PageUp	Previous Event
PageDn	Next Event
p	get polarisation of p-window
shift-p	get polarisation of p-window (using multiple windows)

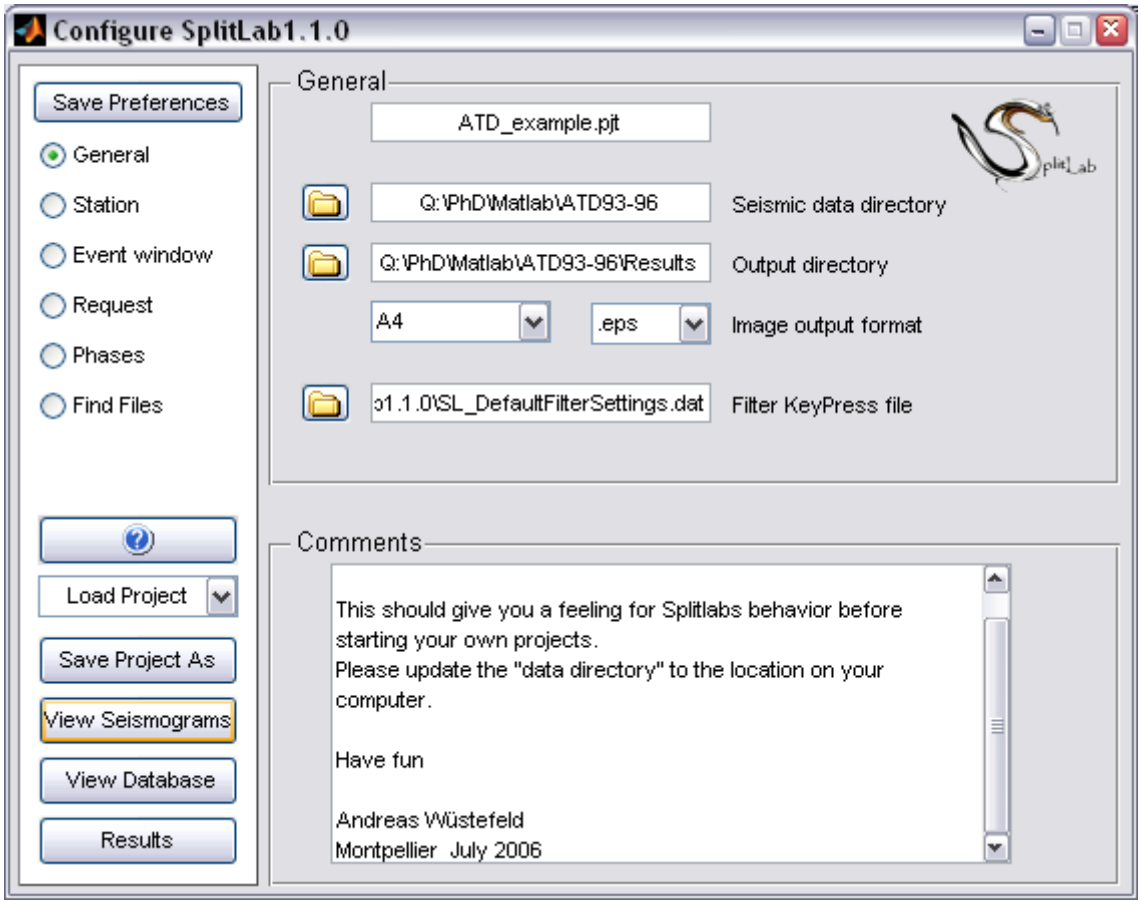
See here for a complete list of keyboard shortcuts

- The values of the polarisation are stored in `eq.bazi` and the field `eq.phase.inclination(N)`, where N is determined by the position of the field with entry 'P-pol' in eq.phase.Names
- Now all time markers of the SAC files (A, F, T0-9) are read and displayed
- Removed bug in delay time error calculation for test-delay times other than 4sec
- Double click on event in the Database Viewer will open it in the SeismoViewer
- Increased the default resolution of jpg images to 300dpi (instead of 72dpi)
- Options for maxSplitTime are now [0.1, 0.5, 1, 2, 3, 4, 5, 6, 7, 8] sec
- Filter presets of the SeismoViewer can be changed using a text file. You can store and re-use your filter settings for various projects
- Options for resampling frequencies are now in Hz :
  'raw','4000','1000','250','100','50','20','10'

  Be careful! This may result in large number of sampling points and slow to process.

8 The Project Configuration Window

8.1 The "General" panel



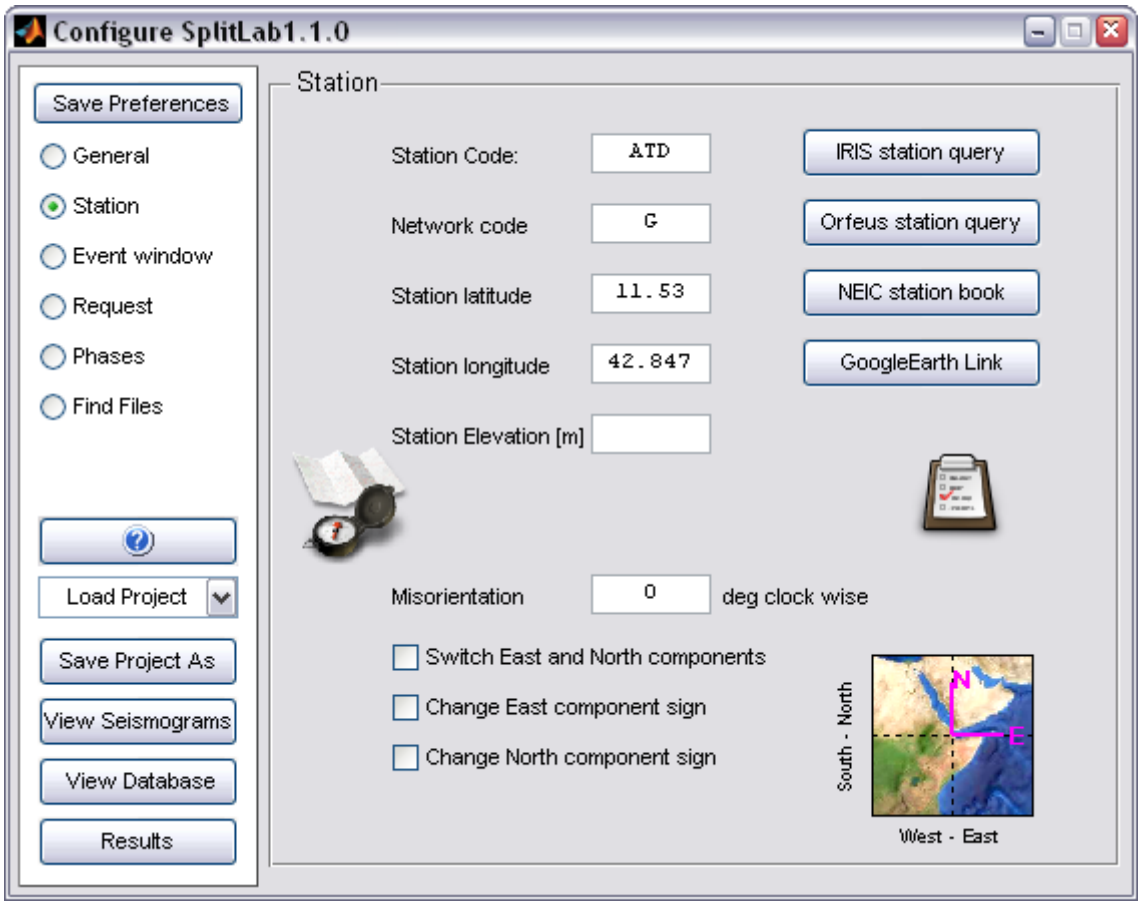
The upper window allows you to define your project name and the directories where the data are and where the output data will be stored. This allows the user to have the data ready in a directory and to store the results in another place, without affecting the data directory. The lower part of the window allows you to store various comments related to this project.

New in Version 1.1 is the “Filter Keypress file”. This allows you to create your own presets of filters used in the SeismoViewer when pressing the keys “0”-“9” on the keyboard. The file consists of 4 tabulator-separated columns (`Key LowerFreq UpperFrewq Order`). The first line is a header line and will be ignored during reading. The next lines describe the filter to be used if the corresponding key is pressed. To describe a lowpass filter set the second column to `0`; for a highpass set the third column to `inf`. See the Matlab documentation on `butter` and `freqz` to obtain more information about filtering.

```
Key   Lower    Upper    Order
1     0.01     0.2      3
2     0        0.2      3
3     0.2      inf      3
```

An example Keypressfile defining a band-, low- and highpass filter, respectively.

8.2 The “Station” Window



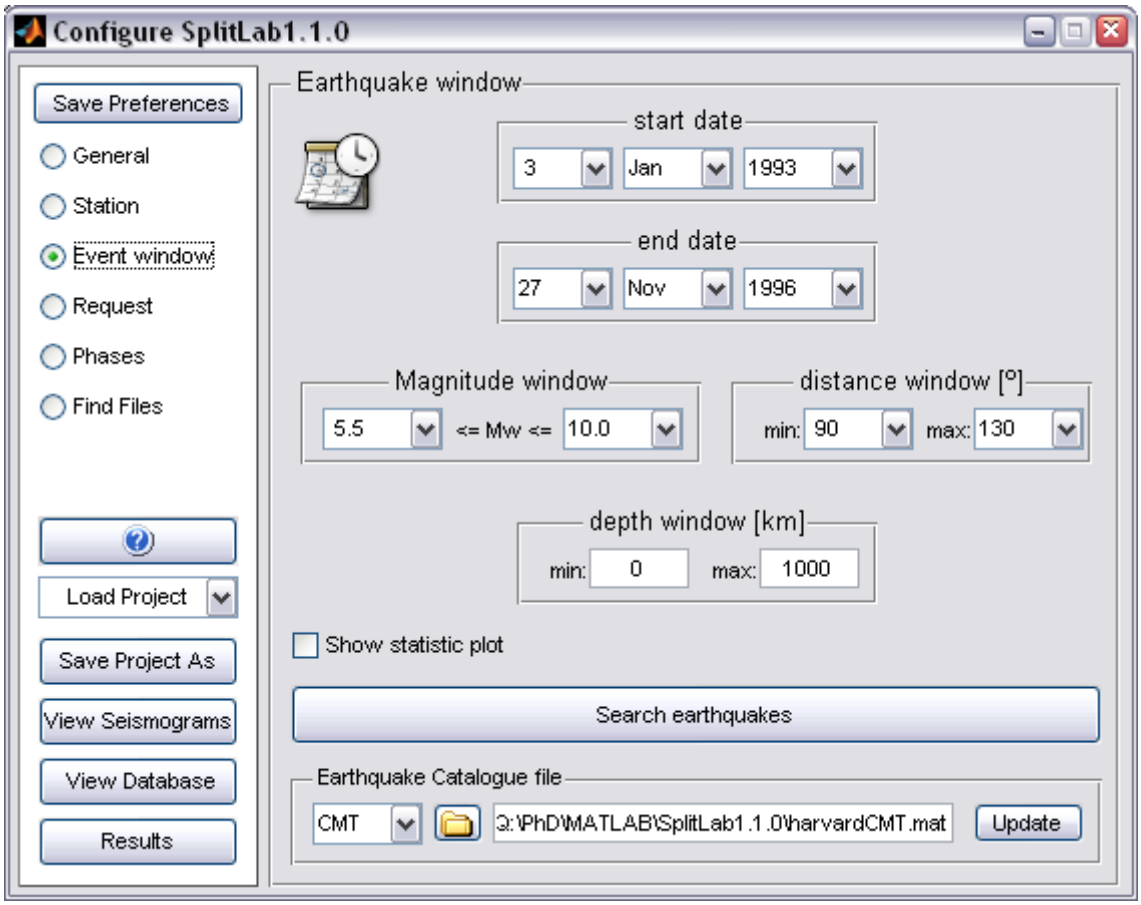
This window summarizes the information related to the station. The station latitude and longitude are absolutely necessary since they are used to select the event from the epicentral distance and to calculate the various phases travel times. Station Elevation is for information only.

If the station has a known *misorientation*, that rotation can be input in this window. This allow the user to work on true N, E and Z components and therefore, on the true radial and transverse components. Note that this operation is performed in Matlab and does thus not affect in any case your raw data.

Problems of component signs or polarities may be corrected in this window and may be combined together with the component misorientation value.

Several buttons of the right of the window provide direct Internet access to station query tools (such as IRIS) or to station books (such as NEIC). This may be useful when preparing a request, to look for instance for a stations in a given area or running during a given period.

8.3 The "Event" window:

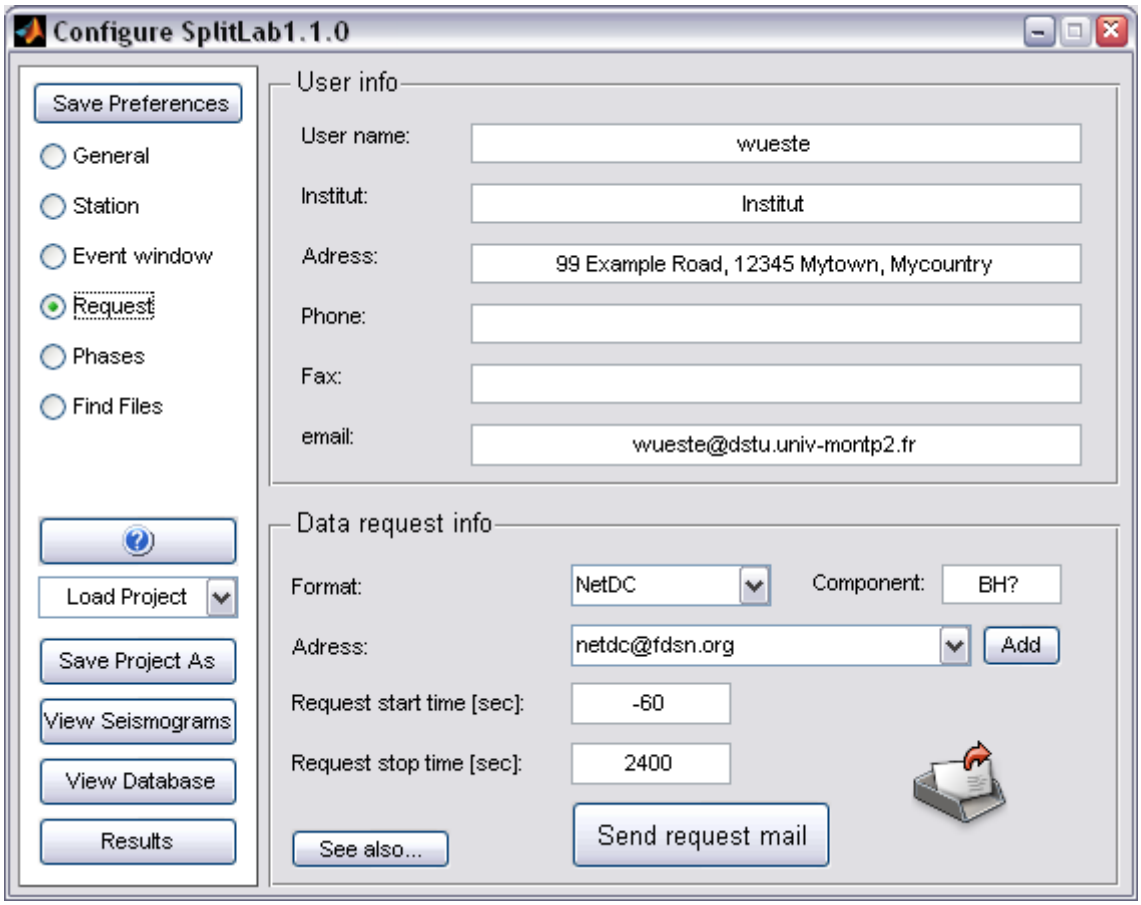


This window allows to prepare your event selection within the earthquake catalog file (NEIC or Harvard CMT) combining the start and end dates, the event magnitude (Mw), the epicentral distance and the event depth. Click on the "Search" button when the parameters are OK. It results (if selected) in the "statistic plot" that displays:

- the event location on a map preserving the true backazimuths,
- the histogram of the backazimuthal distribution, for 360º in green and for 180º in gray
- a rose diagram presenting the same backazimuthal distribution.

The SplitLab package provides earthquake catalogues covering the period 1976 to 2008 and it may be necessary for the user to keep the local CMT or the NEIC files updated in order to search through an updated event catalogue. The "*update*" button provides a way to automatically update the CMT files (in the case of the Harvard CMT format) or the information necessary to request to NEIC the data in the right format (in the case of the NEIC data format selection). Note that the NEIC catalogue does not allow the calculation of the phase energy.

8.4 The "Request" window:



The information that you enter here will allow preparing, formating and sending the request to your selected request site. In the case where you already have the data with you (for instance after a temporary deployment or coming back on old data that you already worked on), you do not have to worry about this window. If you do not have the data, and if you wish to request them, you have to give all the necessary information:

- In the upper part of the window, you have to provide the information generally requested by the automatic request systems: your name, your institute, your address. Your email is absolutely necessary since you will be contacted by mail on the status of your request, and on the availability of the data.

- In the lower part of the window, you have to choose between the various request types (NetDC, BreqFast, AutoDRM or ASCII table) and to the request server where the request will be sent to. You have to define the component you desire, the "start time" relative to the event time (0 corresponds to event time) and the length of the

seismogram in seconds (Figure 1a). There is no way is the present version of SplitLab to prepare request relative to a phase, such as a starting time 60 seconds before a P-wave arrival… Perhaps in a future version…

Click "Send request mail" button and wait for delivery, few minutes, few hours or few days depending on the size of the request and on the activity of the servers. Multiple short requests (less than 200 events) are generally handled faster than one big.

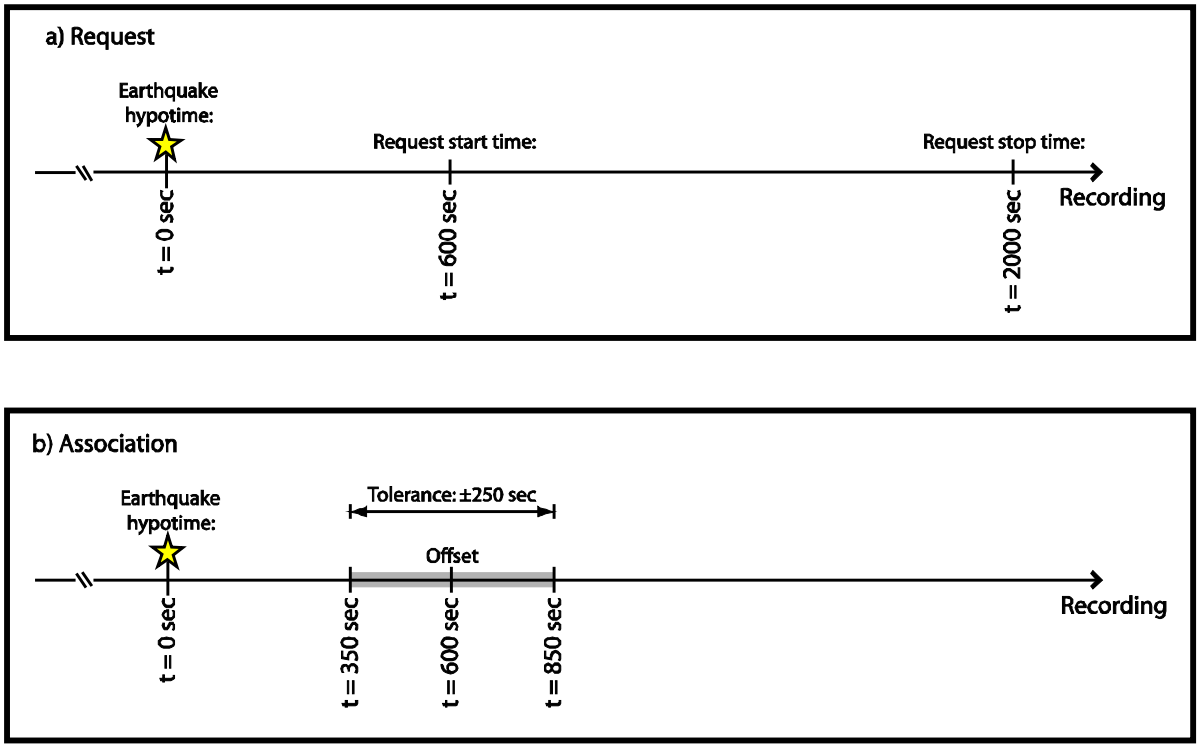
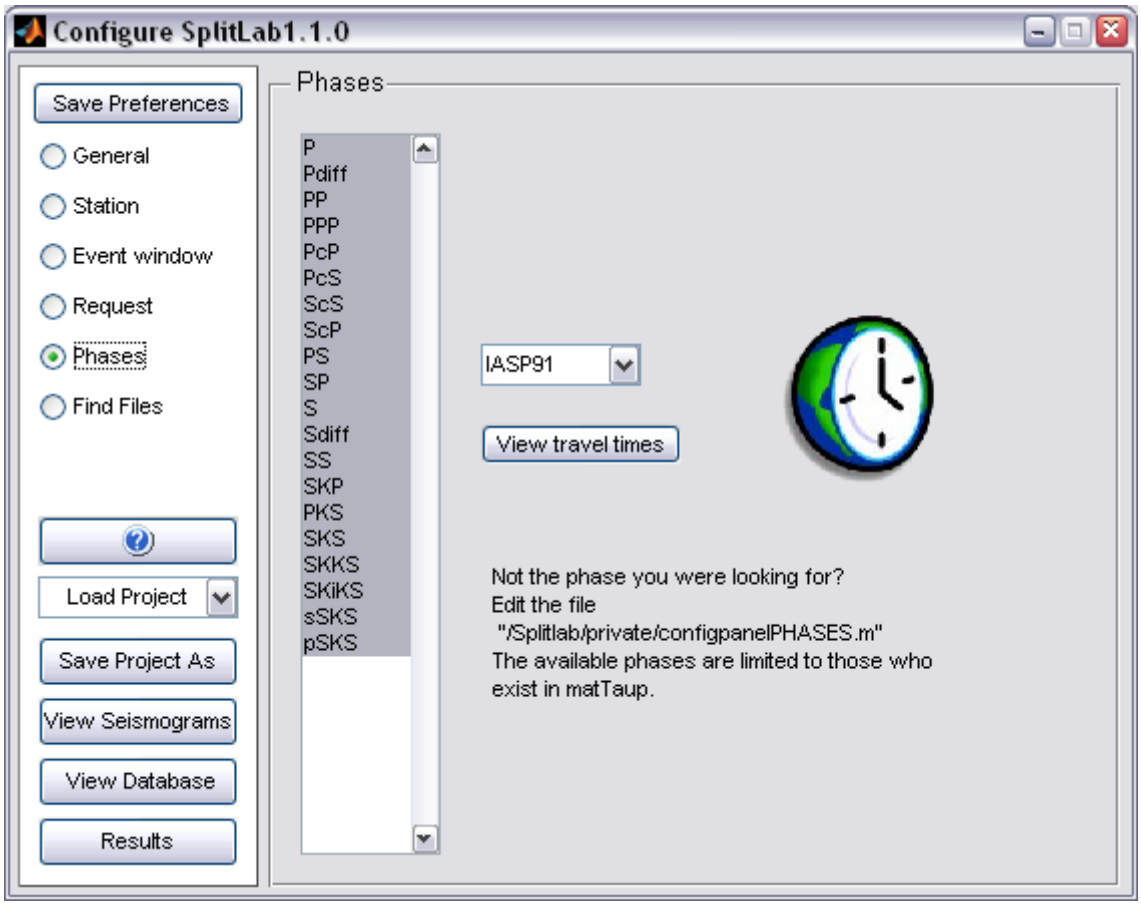


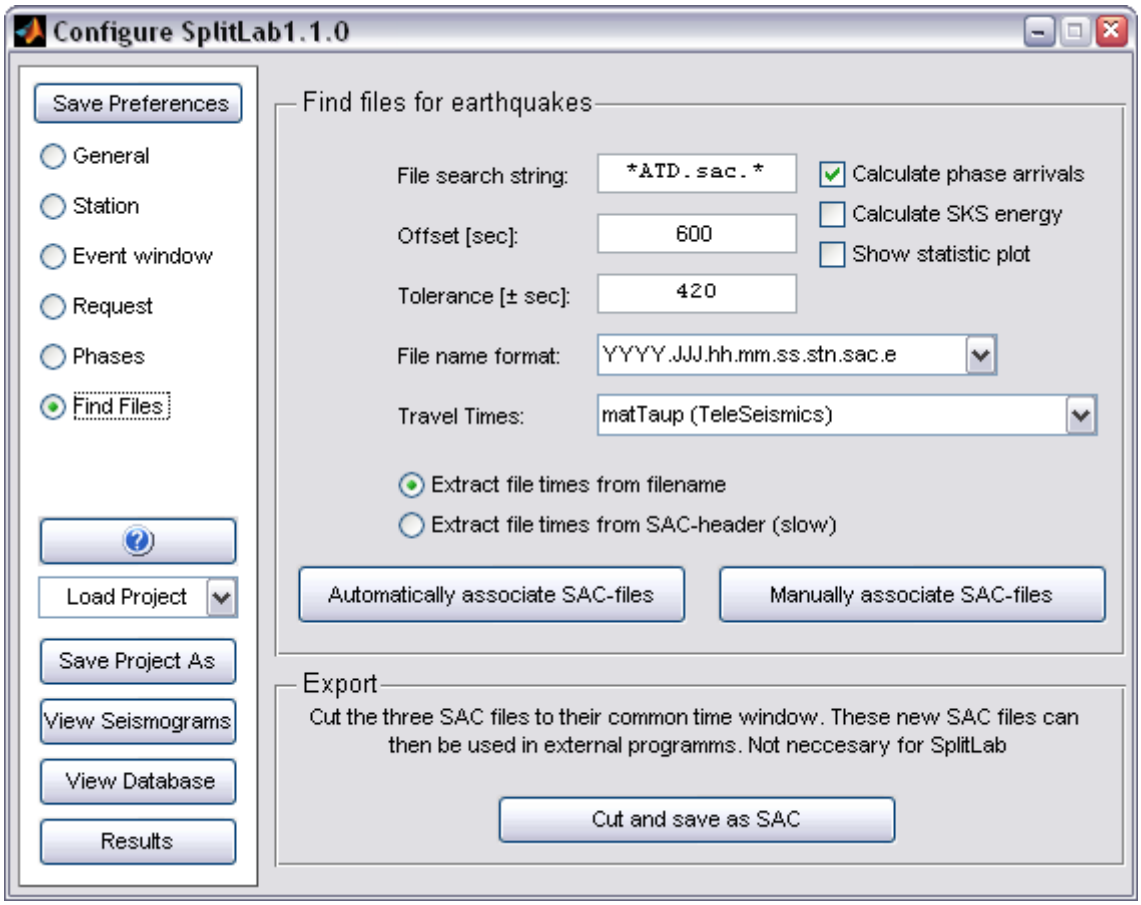
Figure 1: (a) Definition of request start and stop time and (b) their correspondence to the file-search offset and tolerance

8.5 The "Phases" window:



This window allows you to select the phases for which you wish to see the arrival times on your seismograms. These theoretical arrival times are calculated by using the PREM or the IASPEI91 Earth models. The "view travel time" button allows you to see the travel time of the selected phases as a function of the epicentral distance the travel paths through the Earth

8.6 The "Find Files" window



It is the final and important step that will allow you to make the link between the event list and the seismogram list that you actually have, and therefore to built a coherent and effective seismic database. In the present state of the SplitLab package, the filename format is either

- RDSEED (see homepage)
- SEISAN (see homepage)
- YYYY.MM.DD-hh.mm.ss.stn.sac.e,
- YYYY.JJJ.hh.mm.ss.stn.sac.e.
- *.e; *.n; *.z

See "Create your own Format" for more information

Note: A Java version of rdseed for Windows platforms a currently (Sep. 2006) under development by the IRIS consortiumchoose the filename format corresponding to your data. This is absolutely necessary to identify the seismogram components. If you select

*.e; *.n; *.z

the last letter of the filename is used to determine the component of each file and the file start times are extracted for the SAC header. Allowed component descriptors are e,n,z or E,N,Z

It is your responsibility to find the best file-search-string that may help the program to go through the whole set of data in the directory where your data are. Both the * as the ? wildcard is possible. Be aware that files other than the expected seismic data may complicate the task. For instance, the presence of *.sac.r or *.sac.t for radial or transverse component of SAC files will not allow a right linking of events and seismograms. The safest way to make this step successful is to have the directory full of only the sac.e, n and z components.

- The "offset" is the time duration between the event time and the starting time of your seismograms. Ideally, this offset should be identical to the "request start time" defined in the previous window but the data management center may have sent you data beginning later than requested. The offset value represents this difference (Figure 1b).
- The "Tolerance" value in seconds will define the time window within which the program will try to associate a seismic file to an event file, by using either its name or the information contained in the header. It is up to the user to find the best compromise: a value too small will let orphans and a value too large will bring confusion since several files could be associated to a seismic event (Figure 1b).

New to version 1.1 is the travel time calculation menu. Choices are:

- matTaup: Calculate phase arrivals using a standard earth model (IASPEI or PREM). This is to be your choice in teleseismic studies, i.e. epicentral distance >1° or 100km. In local studies, when using direct waves, this generally won't give you any usable results. This is not what TauP was made for…
- homogeneous model: This provides a basic homogeneous half-space model for travel time calculation. You enter v_p and v_s and SplitLab calculates theoretic arrivals for the P and S waves. However be aware that this is a very crude simplification of the geology in your study area.
- If you have any idea of how to improve this please contact splitlab@gmx.net, especially if you know a way of using rayinv or rayGUI in Matlab

If the name of the sac-file is (roughly) the beginning time of the seismogram, then use the "extract time from filenames" button else use the "extract times from SAC headers". This second way is slower since it has to physically open each file to read the header in order to find the begin time that will be used to connect to a given seismic event.

In the best case, the event-to-seismogram link will be created automatically by pushing the "Automatically associate SAC files" button. Otherwise, you can do this association manually via the "Manually associate SAC file" button. Anyway, at the end of the automatic association, the system may provide a list of orphan events and of seismic files that it did not succeeded to link together. This will happen when a wide event selection has been done and will be associated to a rather short existing seismic database. In that case, numerous events

will not be associated to seismic files, but that is normal. Orphans may also happen when two or more events occur in a short time window, smaller than the "tolerance window". In that case the user may terminate manually the association. At the end of this linking process, the seismic "Database" is ready for use. Do not forget to save it ("Save Project" button). This database can then be viewed by using the "View Database" button that provides the list of the events together with the global map. This database will be the starting point of the following processes such as the shear wave splitting measurements.

The "Cut and save as SAC" can be used when the e, n and z components start and end at different times and therefore have different names. This button will cut the beginning of the triplet at the latest start time and the ending time at the earliest ending time of the triplet. The triplets are then saved under new names. This provides a way to export data with coherent lengths and names for other purposes than splitting measurements (Figure 2).

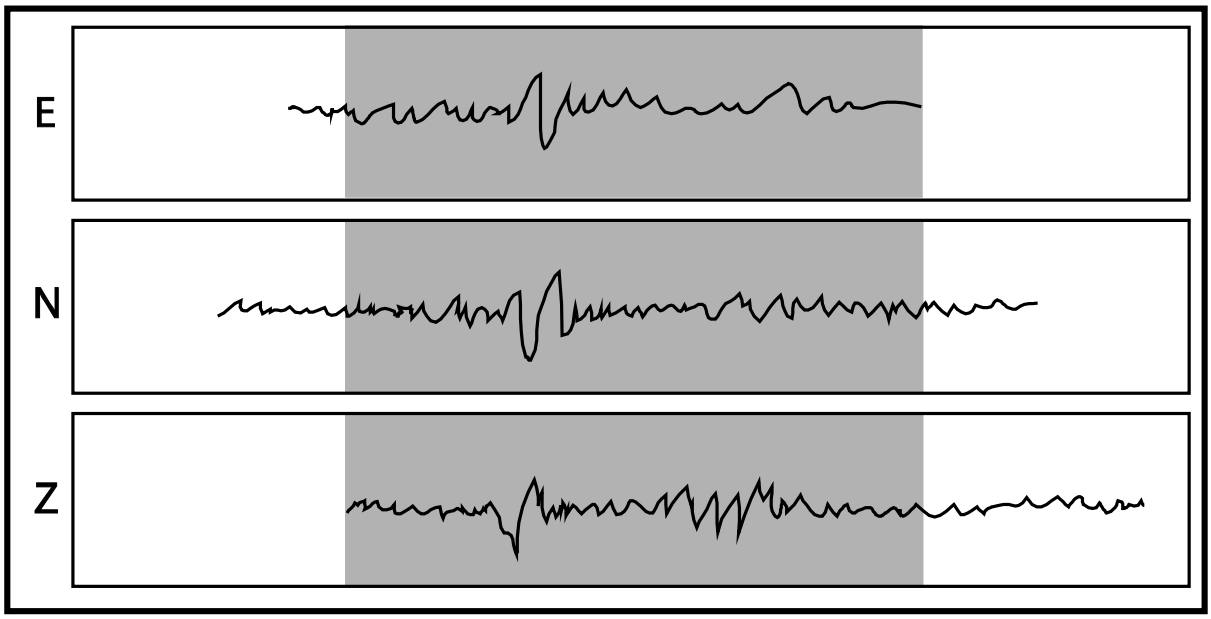


Figure 2 : The "Cut and save" button searches for the three SAC file components (East, North, Z) for their maximum common time window (here marked as gray area). Each seismogram is then cut to this time window and written to new SAC files.

8.7 The “Save Preferences” button

the current configuration is saved as default Project entries for future sessions of SplitLab

8.8 The “?” button

It provides some help and information that may be useful for the user

8.9 The "Load Project" button

Allows to load a project that has been already saved.

8.10 The "Save Project As" button

Allows to save a project. It is important to save a project after having successfully finished the association between the seismograms and the events ("Find Files" operation).

8.11 The "View Seismograms" button

Starts the Seismogram Viewer at the beginning of the database for a newly created database. If you loaded the project, the last used database entry will be displayed.

8.12 The "View Database" button

It provides a way to select and visualize each of the seismogram from the database. The Database is defined as the set of seismograms that have been successfully linked to the selected events. In other words, the database is closely related to a project and a given data selection and might not contain all the SAC files the data directory.

9 The "Database Viewer” window

This window lists the events present in the database and the "World viewer" geographically presents the events form the database. By clicking on one or several events from the list, you can visualize them as stars on the map. The user can zoom in and out on the map.The events are sorted by date as default but you can choose your sorting criteria by clicking at the top of the column, the event distance, depth or magnitude may be useful in the process of shear wave splitting measurements.

The lower part of the window displays the shear wave splitting result(s) that have been saved for a given event. It also presents some button:

- The button "view" allows opening the "preview" window to see the 3 components of the selected seismogram.

- The "Cleanup" button allows removing from the database the events on which no splitting measurements are made. After such an operation, it may be a good idea to save the project under a new name (button "Save Project As"), in order to keep the possibility to come back on data that did not provide splitting measurements.
- The "Export" button allows to save the table as an Excel file.
- The "statistics" button displays:
    - the event location on a map preserving the true backazimuths,
    - the histogram of the backazimuthal distribution,
    - a rose diagram presenting the same backazimuthal distribution.
- The "Presentation" button allows to visualize the graphical results of a splitting measurement. Indeed, when the user saves a result, a copy of the graph is also saved in the output directory.
- The "Remove" button allows the user to remove the result of a splitting measurement from the list.
- The "Edit" button allows visualizing the numerical values associated to the splitting measurements obtained on a seismic event.

10 The "SeismoViewer" window

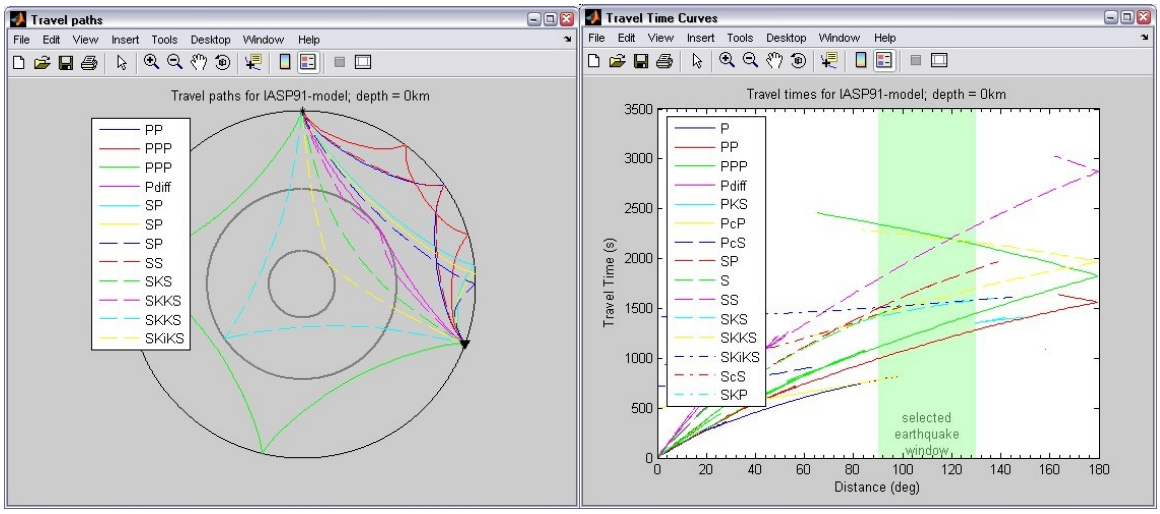
By clicking on the "Preview" button in the "Database Viewer", one accesses to the "Preview" window, which displays the 3 components of the selected event, together with the predicted arrival times (calculated at the "Find Files" stage). The data can be easily filtered through a set of prepared filters accessible through the keyboard. The list of the available filters are summarized together with their shortcuts appear by clicking on the "?" button at the top of the window.

The basic operations and setups are accessible by a set of buttons aligned at the top of the window:

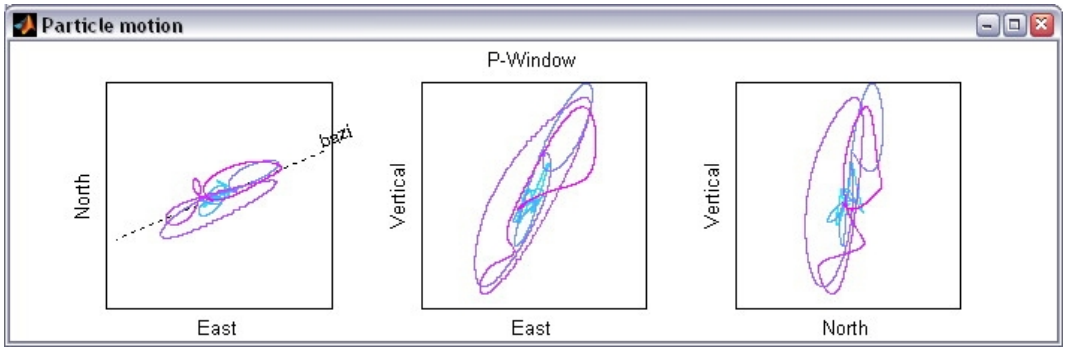
Figure 3 : the SeismoViewer button bar offers manifold options…

- The "SAC" button save the seismograms visible at the screen as SAC files (“SAC screenshot”). Note that only the length of the window is exported.
- The "Database" button allows to select a seismic event through the database
- The "Print" button allows to print the window

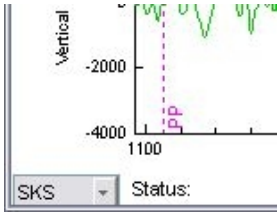
- The "Toggle" button puts and removes grids on the seismogram. By default, each seismogram is vertically scaled to the maximum value of the component.
- The "Lock" button allows to present the 3 component at the same vertical scale
- The "System" button allows to switch between the E-N-Z reference frame to the L-T-Q reference frame.
- The "Time table" button allows to plot the arrival times and the travel paths of one of several seismic phases selected by the user for the current event.



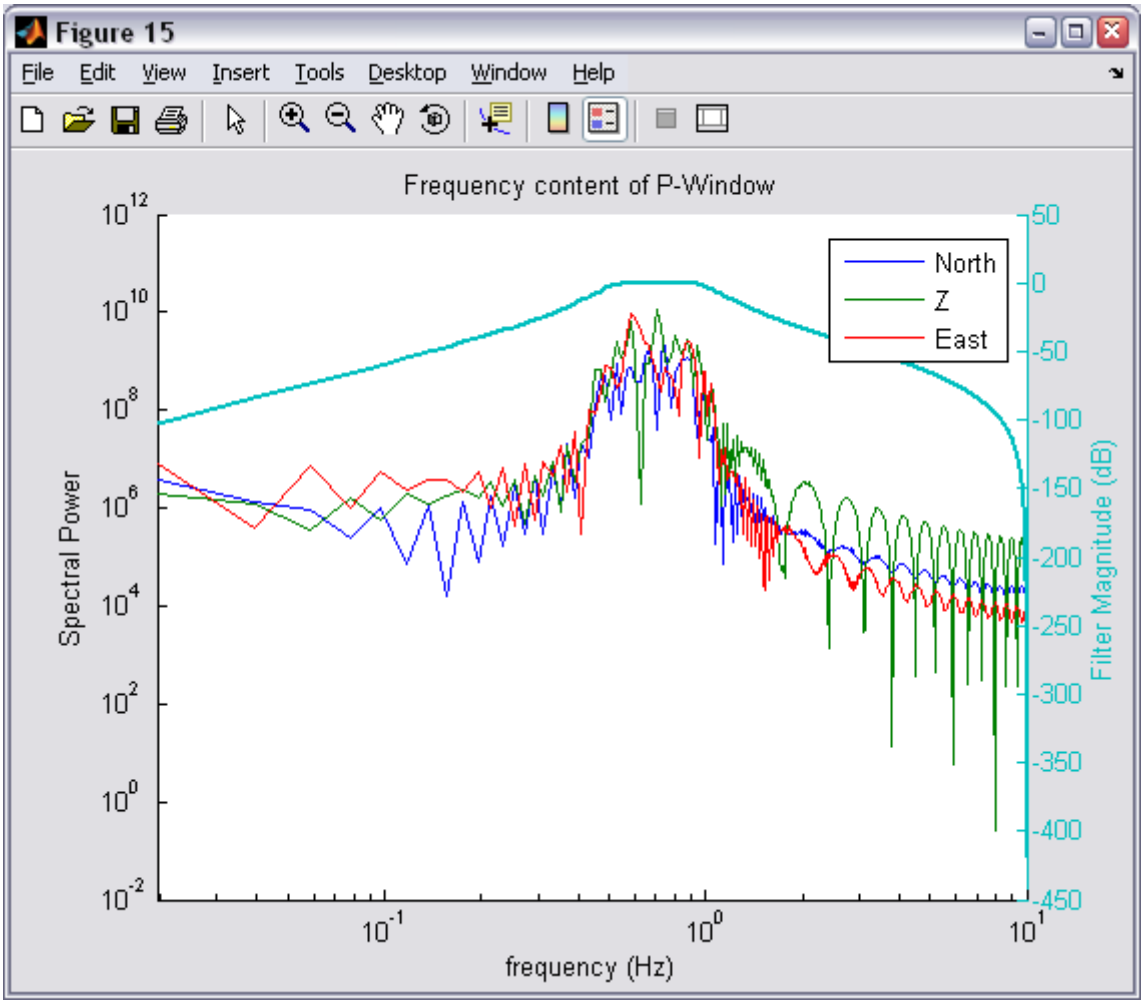
- The "Zoom In" button allows to zoom into a time window defined by the user by dragging the mouse along the seismogram.
- The "Zoom Out" button remove the zoom.
- The "Home" button allows to zoom directly onto a selected seismic phase, that is selected on the rolling menu at the bottom left of the window. It can be accessed also by typing on the "home" key (for the PC) or on the "esc" key for the Macintosh.
- The "Left Green Arrow" allows to visualize the previous seismic event of the database.
- The "Particle Motion" button presents the particle motion diagram of the 2 horizontal component (EN or QT) for the selected time window.



- The "Options" button allows the user to select the type of shear wave splitting measurement: either by calculating the minimum energy on the transverse component or by using one of the various methods that allows determining the minimum eigenvalues. Furthermore, the maximum delay time for the splitting measurement can be set.
- The "Right Green Arrow" allows visualizing the next seismic event in the database.
- The "Trash" button removes the current event from the database.
- The "Speaker" button plays the selected time window as sounds.
- The "Camera" button saves the actual seismogram as a graphic file.
- The "?" button provides help on shortkeys some useful things…
- Performing shear wave splitting measurements through SplitLab
- In the "Database Viewer", select your seismic event and click on the "View" button; It is loaded in the "preview" window
- Visualize your event in the geographic and seismic reference frame, use different kinds of filters and zooming options to evaluate the quality of the data and to locate the core shear phase on which you wish to make your measurement.
- Select the phase-of-interest. The Phase selector can be found in the lower left corner of the SeismoViewer.



10.1 Spectrogram Viewer

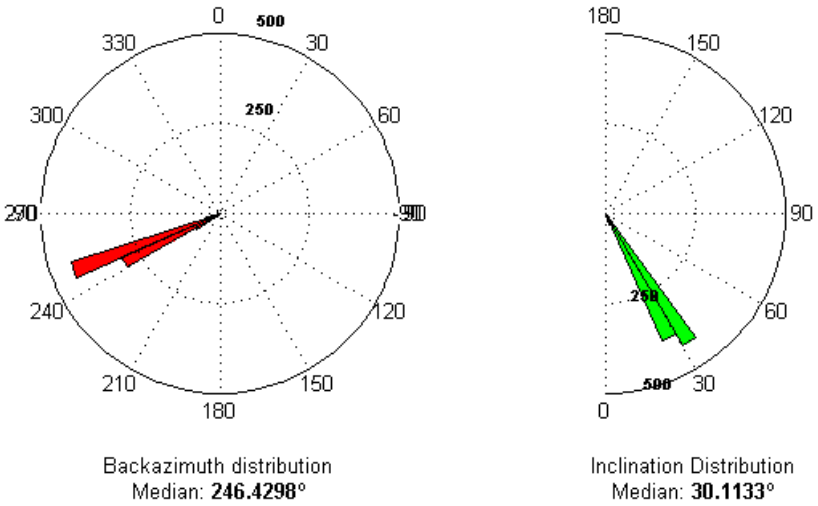


If you select an P-window and press the "s" key on you keyboard, a plot of the spectral power of the three components will be displayed. This gives you a hint whether you have chosen an appropriate filter or time window length. The filter magnitude as a function of frequency is also displayed. For further information see the Matlab documentation on `fft` and `freqz`.

10.2 P-polarisation analysis

New in Version 1.1 is also the P-polarisation analysis. This is to determine the (back-)azimuth and inclination of an event in the case of

- a misoriented station
- a microseismic or local study, where initial polarisation does not coincide with backazimuth



It uses an eigenvalue based method as proposed by Jurkevics[1], 1988. To stabilise the result, an extended window of the actual P-pick is considered and the polarisation is determined in several overlapping windows. If you start the polarisation analysis be pressing an upper-case "P", this is additionally done on several filter sets (by mimicking pressing of keys 0-9. The optimum polarisation direction is then the median of these results.

10.3 How to start Splitting measurement

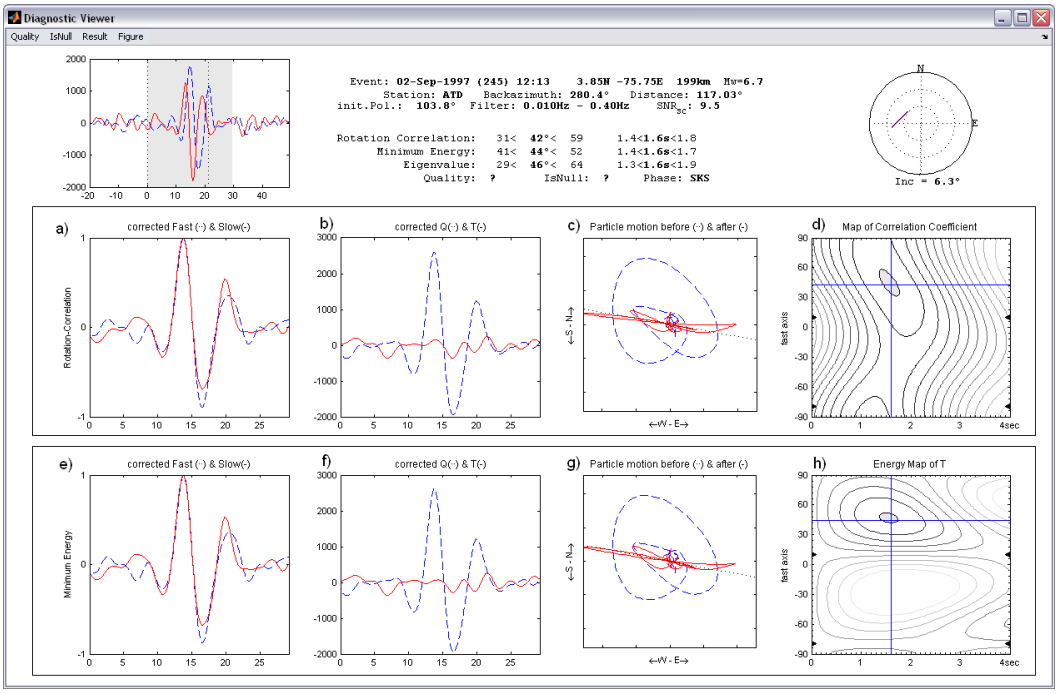
Select the S-window (left-click and drag) on which you want to make the splitting measurement. The active time window will appear in gray whereas the old selection, if any, appears in yellow.

Press the "ENTER" key to start the measurement. When the measurement is finished, the "Diagnostic Viewer" window appears, which summarizes the results obtained by the different methods:

[1] Jurkevics, A. (1988) 'Polarisation analysis of three-component array data', BSSA, 78(5), pp. 1725-1743

11 The DiagnosticViewer

At the top of the window is presented the radial (in blue solid) and transverse (in red dashed) components at the same vertical scale, filtered in an extended section of the previously chosen window without any correction.



- The upper horizontal panel presents a set of diagrams obtained by using the rotation-correlation method. From left to right:
- The fast (blue solid) and slow (red dashed) split components corrected from the delay time. This diagram allows checking the correlation of the waveforms.
- The radial (blue) and transverse (red) components corrected from the anisotropy. This allows to see if the signal on the transverse component has been well removed after correction for the best phi and dt pair.
- The particle motion diagram, before (in blue) and after (in red) the anisotropy correction. In case of a good measurement, the elliptical particle motion is well linearized after the anisotropy (phi and dt) correction.
- The map of the correlation coefficients showing the quality of the correlation between the fast and slow split waves for phi varying from -90 to 90° and for dt varying from 0 to 4 s (or any other maximum delay time chosen in the SeismoViewer options Menu). Note that the program calculates the correlation for steps of 1° in phi and each sample.

The lower horizontal panel presents a set of diagrams obtained by using the minimum energy (or Silver and Chan) method. (Note: If you selected any EigenValue based method, that will

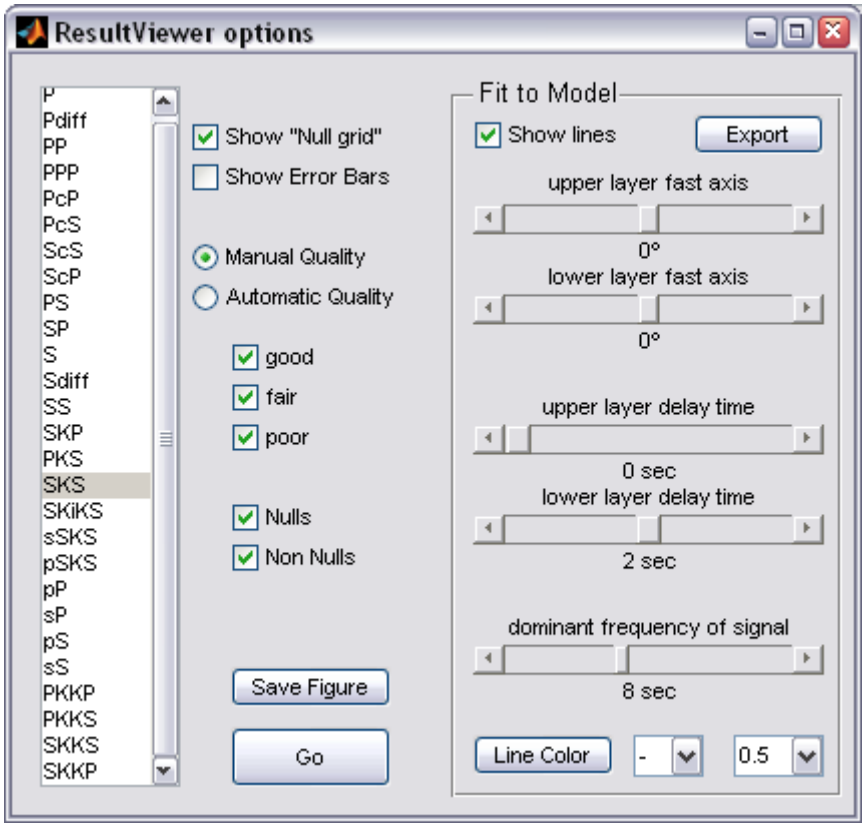
be displayed instead of Minimum Energy). From left to right:

- The fast and slow split component corrected for the best delay time.
- The radial and transverse component corrected from the anisotropy.
- The particle motion diagram, before (in blue) and after (in red) the anisotropy correction.
- The map of the Energy on Transverse components or of Eigenvalue (as chosen in the Option Menu of the SeismoViewer). Here, the grid-search parameters are 2º in phi and 2 samples in time. For a 20 Hz acquisition (delta of 0.05 s between two samples), the time steps will be of 2x0.05=0.1s.

The results are summarized in the upper part of the window, as numerical values and the error bars for the different methods and as a polar diagram on which the fast direction is plotted with the actual backazimuth and inclination.

If you do not like the measurement, go in the "Results" menu and choose "Discard" to reprocess another time window, another phase or to test another filter. If you wish to keep this measurement, you have to choose a quality in the "Quality" menu, to indicate whether it is a null or not in the "IsNull" menu and to save it in the "Save" menu. Note that the quality and null information are just comments and have no role in the subsequent process. In that case, the figure is saved in the format selected in the "configuration" panel and the numerical results are also summarized in the "Database Viewer", linked to the right event. The “Result Viewer” window

12 The “ResultsOptions”



The “ResultViewer Options” window allows to select which part of the result database you want to see:

In the “Phases” panel select the phases of which you want to see the results

Select if you want the “Manual Quality” of the “Automatic Quality”. The former uses the Quality assigned to each measurement in the “Diagnostic plot” The latter determines the quality of each measurement based on the difference between the RC and SC results. See Wüstefeld & Bokelmann, (BSSA 2007) for details

- Select the Qualities you want to see: good, fair, poor
- Select if you want to see the Nulls or non-Nulls (or both)
- Select “Show Error bars” if you want to include the error limits of each measurement
- Select “Show Null grid” to display grid-lines in the fast axes plots. The solid grid-lines indicate where backazimuth and fast-axes coincide. The dashed grid-lines indicate a 45° difference between backazimuth and fast axes.

The “Fit to Model” panel allows to calculate the theoretical backazimuthal variation of the fast axes and delay times (Savage & Silver, 1994). Set the delay time slider of second layer to “0” to see the lines for a single layer model. Note that the “Export” button only works if the results window is drawn (press “Go” first). This saves the theoretic two-layer lines to a file.

12.1 The “Backazimuth distribution”

The results corresponding to the selected options are displayed for each technique (RC, SC, EV). The fast axis estimates make up the first row, the delay time estimates the second row.

In the third row of the result plot, stereoplots of the non-Null results are displayed. The lengths of the markers scale with the delay time, the centre of the lines correspond to backazimuth and the inclination of the wave at surface.Trouble shooting

13 Trouble Shooting

13.1 Installation problems

(see also here: http://www.gm.univ-montp2.fr/splitting/install.html)

In case of problems please check:

The file classpath.txt You can view the file by typing in Matlab: edit(which('classpath.txt'))

This file contains the path to JAVA classes in Matlab.

At the end of the file should be the proper path to the file "matTaup.jar" located by default in $MATLABROOT/toolbox/matTaup/lib/matTaup.jar

After editing classpath.txt you have to restart Matlab

The Matlab search path should contain the following folders:

`SplitlabX.X.X/`

`SplitlabX.X.X/Tools`

`SplitlabX.X.X/ShearWaveSplitting`

The path to the SacLab Utility

`SplitlabX.X.X/SacLab`

The path pointing to matTaup (usually at the end of the path)

`$MATLABROOT/toolbox/mattaup`

For editing the path use the command: `>> pathtool` or edit/create your local `startup.m` file. See the Matlab documentation for startup options

13.2 Create your own filename format

The association of a SAC seismogram to an event in the Database is is done in tow steps:

The finding of appropriate file start times corresponding (within a tolerance and eventually an offset) to the hypocentral time (Figure 1). This is done in the Matlab function in `/Tools/getFileAndEQseconds.m`

The ordering of three matching files by component: East, North, Vertical. This ensures that in the database variable eq.seisfile of your project the first entry corresponds always to the East component, the second entry to the North component and the third to te Vertical. This is done in the Matlab function in `/Tools/sort_components.m`

Two variables of your project configuration determine your choices:

`config.FileNameConvention` is a string corresponding to your selection in the File-Format Menu (eg 'RDSEED')

`config.UseHeaderTimes` is a logical value: "1" means you wish to use SAC header times, and "0" means you would like to use the filename to determine the start time of the file.

Knowing all this, adding a new Filename format should now be straightforward:

```
>> edit XXX/Tools/getFileAndEQseconds.m
```

- go to the line which states

  ```
  switch config.FileNameConvention
  ```

- after this line add a new case statement:

  ```
  case 'MyFormat'
  ```

  state the positon of year, julian_day, hour, minute and second in the filename. If not all these informations are given, make sure you set the search-tolerance and search offset appropriately! Please use the existing formats as templates to your format. If your format uses day and month instead of julian_day, you have to use the "`dayofyear`" function, as in the 'YYYY.MM.DD-hh.mm.ss.stn.sac.e' format.

  The given values have to be transformed to seconds after Jan, 1st of the corresponding year. Add something like the following:

  ```
  FIsec  =  FISS + FIMM*60 + FIHH*3600 + (FIddd)*86400;
  ```

  Note, that this approach omits any event lose to "midnight, new year".

- Save /Tools/getFileAndEQseconds.m
- Type

```
>> edit /Tools/sort_components.m
```

- go to the line which states

  ```
  switch config.FileNameConvention
  ```

- after this line add a new case statement:

  ```
  case 'MyFormat'
  ```

  Define then a variable `pos` whose value corresponts to the position of the Letter in the filename which determine the Component name. For expample, if the Component corresponds to the 18th letter, use: `pos = 18;` Please use the existing formats as templates.

- Save /Tools/sort_components.m
- Finally add your format to the file format menu

  ```
  >> edit XXX/private/configpanelFINDFILE.m
  ```

- find the line where the menu entries of the uicontrol are defined:

  ```
  str = {'RDSEED' 'SEISAN', 'YYYY.JJJ.hh.mm.ss.stn.sac.e'
  'YYYY.MM.DD-hh.mm.ss.stn.sac.e'};
  ```

- add your format to this cell array:

  ```
  str = {'RDSEED' 'SEISAN', 'YYYY.JJJ.hh.mm.ss.stn.sac.e'
  'YYYY.MM.DD-hh.mm.ss.stn.sac.e' 'MyFormat'};
  ```

  All entries should be in a single line! Furthermore, this entry name should be exactly the same as used before since it determines the value of the variable `config.FileNameConvention`

- save XXX/private/configpanelFINDFILE.m
- restart SplitLab

13.3 Preferences problems

During installation, SplitLab preferences are added to the Matlab environment (See the prefdir documentation for further details on preferences). The SplitLab Preferences contain the fields CONFIGURATION (default SplitLab project configuration), ASSOCIATIONS (figure export file types and, on non-PCs, the system command line to open the file type) and HISTORY (recently used SplitLab Projects). These preferences are only valid for the user, who installed SplitLab. However, if a new user runs SplitLab, new default preferences are automatically created for that user. In multi-user case be sure that all users have permission to

the SplitLab, SacLab and matTaup path and the paths are set correctly for each user.

14 Keyboard Shortcuts

f	Open filter dialog box
p	Perform polarisation analysis on P-wave window
s	Plot the spectrogram of the current P-wave window
Enter	Start Splitting Measurement
Space	Rotate between ENZ and QTL system
Backspace	Reset zoom
RightArrow	Scroll right
LeftArrow	Scroll left
UpArrow	Zoom In
DownArrow	Zoom Out
Home/Escape	Zoom to phase
PageUp	Previous Event
PageDown	Next Event
0	unfiltered data
1	0.01 - 0.1Hz
2	0.02 - 0.2Hz
3	0.02 - 0.3Hz
4	0.01 - 0.3Hz
5	0.01 - 0.4Hz
6	0.02 - 1Hz
7	0.01 - 0.15Hz
8	0.02 - .025Hz
9	0.01 - 1Hz
+	Add 0.002Hz to lower filter frequency
-	Substract 0.002Hz from lower filter frequency
*	Add 0.02Hz to upper filter frequency
/	Substract 0.002Hz from upper filter frequency

Note: The preset filters can be changed in the file `XXX/private/seisKeyPress.m`