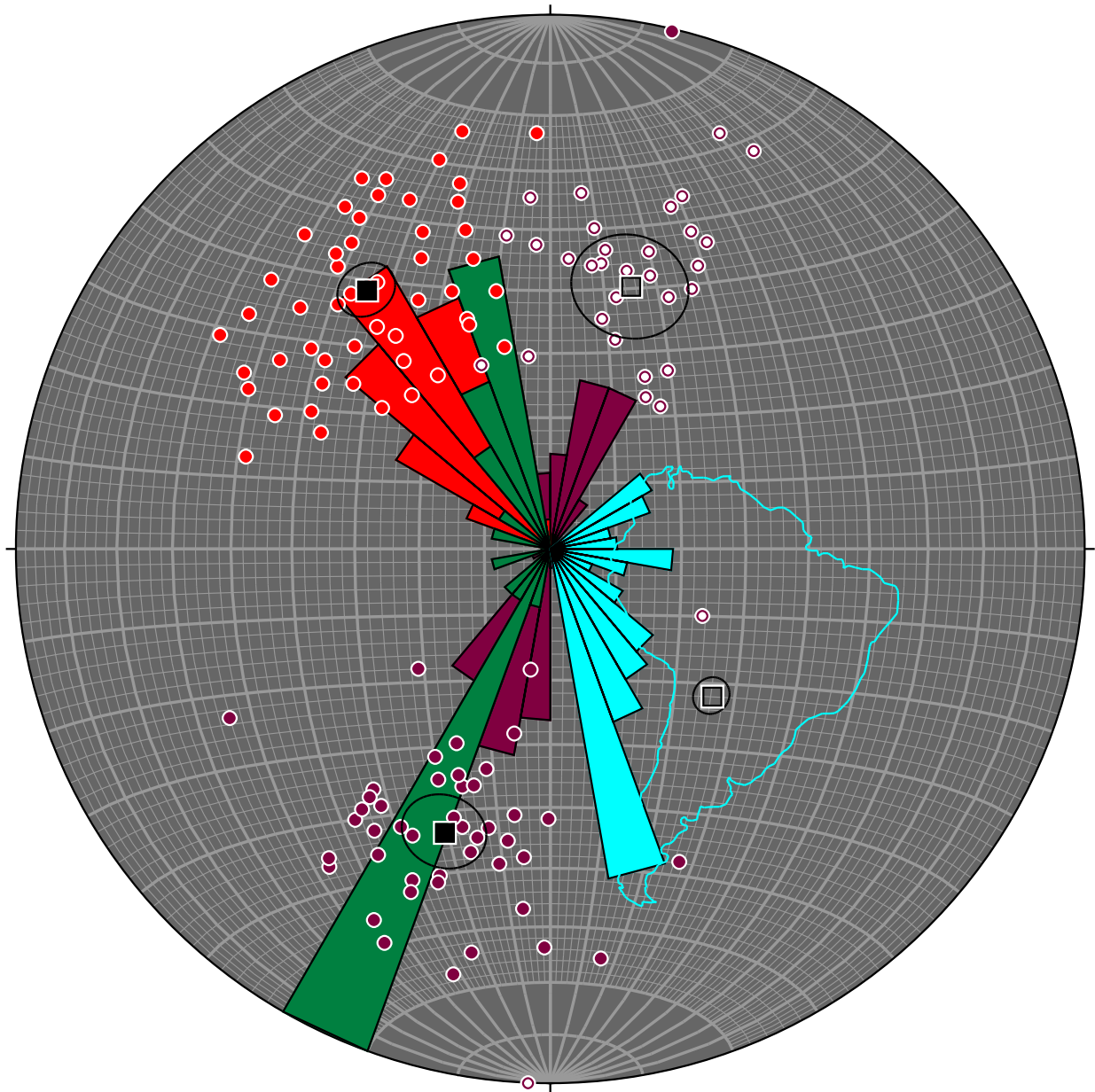


Stereonet 7



Richard W. Allmendinger © 2011

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Disclaimer

Stereonet 7 is distributed on an "as is" basis without any warranty, explicit or implicit. The author will not be liable for direct, indirect, incidental, or consequential damages resulting from any defect in this software or this user's manual, even if he has been previously been made aware of the defect. Furthermore, I make no systematic effort to inform all users of either bug fixes or upgrades. This program may not be sold or offered as an inducement to buy any other product.

Referencing this Program

The science behind the algorithms in Stereonet 7 can be found in the following references:

Allmendinger, R. W., Cardozo, N., and Fisher, D., in press, Structural geology algorithms: Vectors and tensors in structural geology: Cambridge University Press (book to be published in early 2012).

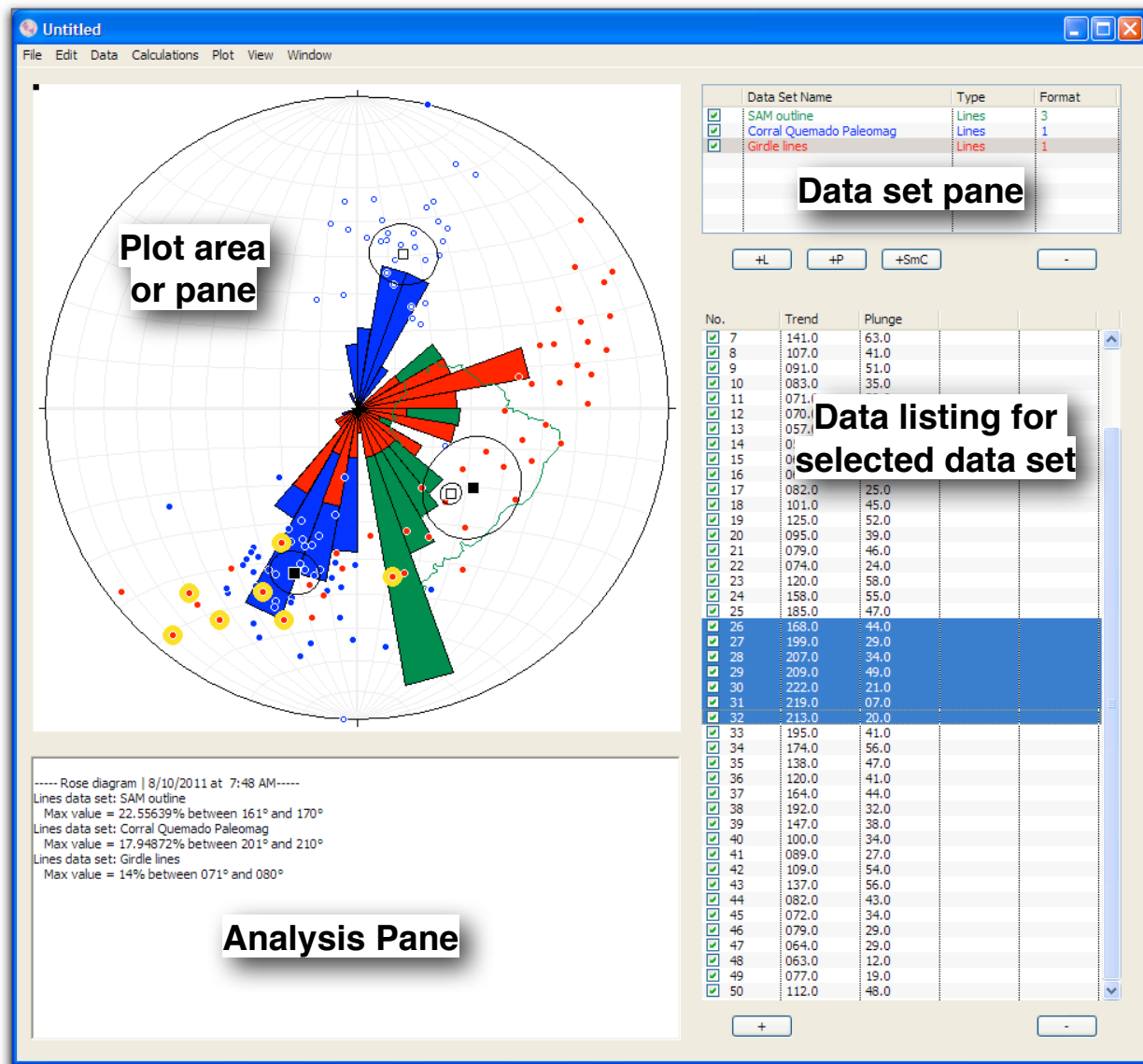
Please refer to this publication in any study or presentation that result from the use of this program.

Credits

Stereonet 7 was written by Richard W. Allmendinger; the interface for the program is modeled after OSXStereonet by Néstor Cardozo and Richard Allmendinger. The rotation algorithm has been completely rewritten from one originally written by Randy Marrett. The contouring algorithm used is "conrec" by Paul Bourke (1987). The eigenvalue and eigenvector routines have been modified from the book *Numerical Recipes*. The PDF classes included in this program are from pdfFile by Toby W. Rush Copyright © 2004. I am particularly grateful to comments and advice from Néstor Cardozo during the development of this program and for sharing many other programming adventures.

Introduction

Stereonet 7 is a complete rewrite of my venerable, but aging, stereonet plotting program for Windows, originally called "StereoWin". The program has a revamped, and vastly improved, user interface, includes most of the scientific functionality of the older versions, and will work just fine on modern operating systems such as Windows 7. The functionality and interface of the program has been modeled after OSXStereonet by Néstor Cardozo and Richard W. Allmendinger. The only difference is that OSXStereonet uses an interface with a main window and two drawer windows that can be opened and closed at will, whereas Stereonet 7 version uses a single window with several different panes for different interface elements (Fig. 1).



Differences with Previous Versions of StereoWin (and Stereonet)

There are several significant changes in how Stereonet 7 works relative to how older versions worked.

- When Stereonet/StereoWin was first written more than 20 years ago, personal computers were so slow that you could literally watch them drawing individual great circles! So older versions of Stereonet/StereoWin drew the layers of graphical elements in the order that the user specified and went to great pains to avoid redrawing previous elements. With modern systems, the graphics can be delivered all at once. So, Stereonet 7 always layers different elements in the same order, regardless of what order the user specified. It is now possible to turn on or off different graphical

elements without redrawing everything else. So, you won't see the dreaded new plot or old plot dialog box any more. Want to turn off the great circles that you plotted six steps ago? Just uncheck them in the Plot menu and they will disappear while everything else that you drew afterwards remain intact.

- Plots can be saved from Stereonet 7 in now as PDF or .emf format. The former is a higher quality format so you should use that if possible. Some programs that claim to be able to read pdfs might claim that the file is damaged or otherwise be unable to read the file. If that happens, just open the file in Acrobat Reader and then save it.
- Interaction with your data has been much improved in this version of Stereonet 7. You can click on a point and have the corresponding row in the data table highlighted or vice versa. Data can be edited simply by clicking on the line of data that you wish to change and typing in a new value.
- Sorting of your data is now accomplished by clicking on the heading of the column in the data table that corresponds to the parameter you want to sort by. The data table supports multiple selections, and you can then toggle on or off the data (i.e., check or uncheck them) based on whether or not they are selected in the data table.
- A single Stereonet 7 file can contain an unlimited number of lines, planes, and small circles data sets. These individual data sets can be toggled on or off at will simply by checking/unchecking them in the Data set pane.
- You now set all plot elements in the Inspector Window. In general, you have much greater control over the appearance of your plot than previously (see Fig. 2)
- Stereonet 7 can import (and export) old Stereonet/StereoWin text files that contain the appropriate two letter header, but the save and open commands now work on the new Stereonet 7 binary data files. If you need to exchange data with OSXStereonet, you must export text files from Stereonet 7 and then import them into OSXStereonet. At present, the binary files produced by Stereonet 7 and those produced by OSXStereonet are incompatible.
- Stereonet 7 binary files include not only the structure data but also the exact state of the program (including the Analysis Pane), all colors, parameters, etc.

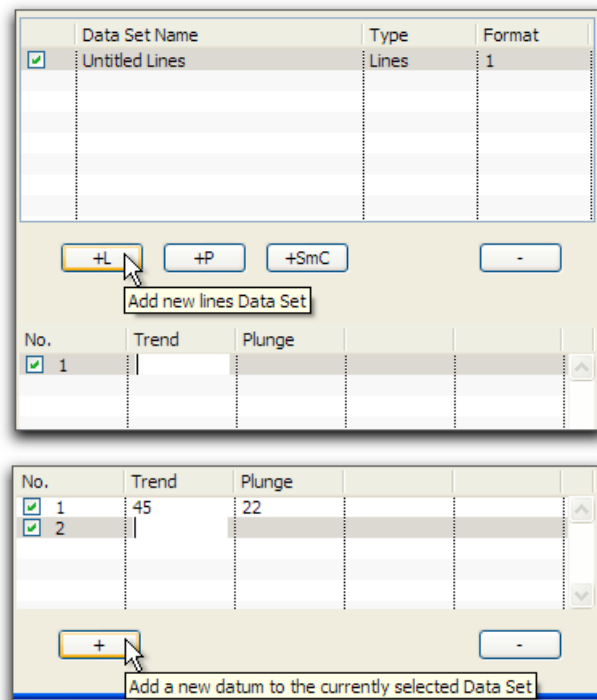
- In Stereonet 7, numerical analyses are written to the Analyses pane. This is an editable text field. Not only can you copy and paste to that field, but you can write your own notes and annotations there. Just click where you want to start writing. This field is *not* saved with the plot so, to capture its contents when you close the program, be sure to copy them to the system clipboard and then paste them wherever you want.
- The amount of data that Stereonet 7 can hold is limited only by available memory. Earlier versions of Stereonet/StereoWin were limited to 2500 lines and 2500 planes.
- This beta version of Stereonet 7 is (still) not “document” based. Thus, its behavior is like that of previous versions. There is a single window into which you read your data sets. When you read in a new data set whatever was there previously is wiped out. Be sure to save any changes!!

Using Stereonet 7

Entering new data

To enter a new data set into the program, first click one of the three buttons located beneath the Data set pane. +L will add a new lines data set; +P will add a new planes data set; and +SmC will start a new small circles data set. *To enter lines as rakes in planes, hold down the Shift Key while clicking the +L button.* Each button has a “tool tips” or hint that appears, as shown in the graphic to the right, in case you forget what each button does. Clicking any of those three buttons will add a new data set and will add a line to the data listing pane, so that you can immediately begin entering data. In the example shown in the figure one would first type the trend measurement, then press the tab key to move to the plunge column to enter the plunge measurement. After entering the plunge, if you press the Return Key, a second line will be added automatically to enter another line of data. Alternatively, you can click the “+” button beneath the data listing pane to add a new line of data.

If you are entering rakes of lines



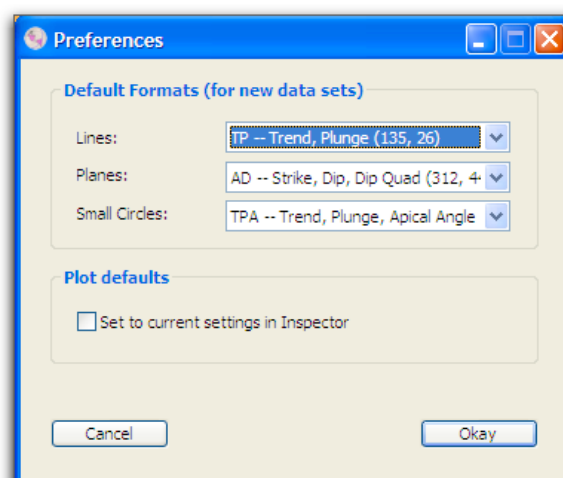
on planes, Stereonet 7 will create both a lines data set and a planes data set. These two data sets must be given the same name. If you delete the planes data set (or change its name), you will still be able to show the lines data, but you will not be able to display it using the rake (RK) format.

The name of the data set can be edited at any time by clicking on the name (e.g., “Untitled Lines”) and then typing in whatever you want. It is useful to give the data sets sensible names because those are used in various operations (e.g., poles to planes, rotations) and are saved as part of the binary file. Note that you can set the default format for newly entered data by selecting Preferences.

You can also *add data by clicking the mouse* inside the primitive of the stereonet. To enable this option, select “Enter with mouse” from the Data Menu. A message will appear explaining how to plot lines and planes. Anytime “Enter with mouse” is checked, you can enter a new line by holding down the **Shift Key** while clicking, or enter a new plane by holding down the **Alt Key**. In both cases, the datum is entered when you release the mouse, not when you click the mouse. When choosing a new plane this way, the place that you click the mouse becomes the pole to the plane; as you drag to move the pole around, the corresponding great circle is displayed. The first time you enter data with the mouse, it will be placed in a special data set named “ad hoc lines” or “ad hoc planes”. Any subsequent lines or planes added with the mouse will be added to the same ad hoc data set, rather than creating a new data set. As long as Stereonet 7 finds either of those two data sets listed, data entered with the mouse will be added to the existing data set. You can, of course, change the name of the data set to whatever you want; however, when you do so the program will then create a new “ad hoc lines” or “ad hoc planes” data set for any subsequent lines or planes entered with the mouse. In practice, these ad hoc data sets will most likely be used for temporary constructions. You can turn them off with the appropriate checkboxes or delete them entirely once you are done. They are saved with the binary file.

Setting Data Format Preferences

From the preferences command under the Windows Menu you can select the default formats for new data sets. To set default colors, styles, line weights, point sizes, etc., set all of those features in the Inspector, then check the box, “Set to current settings in Inspector” before clicking Okay in the Preferences dialog.



Deleting Data

You can delete an individual datum by selecting the line of data in the data list pane and then pressing the “-” button located beneath the data list pane. The datum will be deleted and the remaining lines beneath the datum will be shifted upwards. If you have a multiple selection in the data list pane, only the first line of data will be deleted.

To delete an entire data set, selected in the Data Set pane and then press the “-” button located beneath the data set pane (i.e., to the right of the add data set buttons). The data set and all of its associated data will be deleted.

No warning is given when you press the “-” for either data sets or individual lines of data!! They are simply deleted.

Opening a Data File

Importing text files

Using the “Import Text File” command under the File Menu, you can read in a text file that has a two letter header on the first line of the text file. These were the only sorts of files that could be used with StereoWin and versions of Stereonet for Mac versions 6 and earlier. The following table has a description of the two letter codes that Stereonet 7 recognizes:

<i>Data Type</i>	<i>Code</i>	<i>Example</i>	<i>Description</i>
Lines	TP	277, 42	The trend value appears first, followed by the plunge. A negative plunge indicates a vector pointing into the upper hemisphere.
	PT	42, 277	The plunge value appears first, followed by the trend.
	PQ	42 N 83 W	The plunge value appears first, followed by the trend, given in quadrant format. The trend must contain a letter (N, E, S, W), a number between 0 and 90, and another letter (N, E, S, W).
	LL	41, -76	The latitude of the point appears first, followed by the Longitude. South latitude and west longitude are given as negative numbers.
	RK	123 23 E 45	Lines are specified as a rake (pitch) in a plane. The plane orientation is given first in AD format, followed by the rake from the given strike azimuth.

<i>Data Type</i>	<i>Code</i>	<i>Example</i>	<i>Description</i>
Planes	AD	320 25 W	Strike azimuth between 0 and 360° is given first, followed by the dip magnitude, and then a letter specifying the quadrant (N, E, S, W) of the dip direction.
	AZ	140 25	This format assumes that the dip azimuth is located clockwise from the strike azimuth. In other words, if you give a strike of 137, Stereonet will assume that the dip azimuth is 227 (to the southwest). In this example, if your dip is to the northeast then you should specify a strike azimuth of 317. This is the format that Stereonet uses for all of its internal calculations, even if you don't enter it that way.
	QD	N 40 W 25 W	In this format, you can report any bearing with respect to N, S, E, or W. For example, the program will correctly interpret W 50 N the same as N 40 W. Only the first letter is significant for the compass directions (SW is interpreted as S).
	DD	25230	A format more commonly used in Europe. Note that the dip magnitude (vertical angle) comes before the dip azimuth.

Following the two line header, there were any number of lines, each with only one datum (e.g., trend and plunge, or strike and dip) followed by a return character. The values on the line can be separated by a comma, space, tab or any combination.

Opening Stereonet 7 Native Files

Stereonet 7 introduces a new binary file format that, in a single file, contains not only all of the data sets entered, but also all of the settings at the time the file was saved. This includes all of the formatting you have applied to the stereonet (e.g., colors, grid spacing, projection, etc.), the data (e.g., colors, symbols, line weights, etc.), the plot itself, and the contents of the Analysis pane. Opening a Stereonet 7 native file is just like picking up exactly where you left off when you last saved the file.

Saving Data Files

Likewise, Stereonet 7 can save data files in two formats:

Exporting Text Files

Use this option in the File menu if you want to save a text file with a two line header, just like older version of Stereonet/StereoWin. Lines are only saved with the TP (trend, plunge) format and planes are saved only with the AD (Azimuth Dip, i.e., right hand rule) format. Use export text file if you want to exchange data with OSXStereonet or with older versions of Stereonet/StereoWin.

Save Stereonet 7 Native File

The “Save As...” command under the file menu saves a Stereonet 7 native (binary) file with the file suffix “.stnt”, which can only be read by Stereonet 7. As described above, these files contain an exact copy of the state of the program and data at the time that you save the file.

Choosing which data to plot or analyze

Stereonet 7 will only plot or analyze data that are checked in the Data List pane to the right of the plot, and it will only plot data sets that are checked in the Data Sets Pane. The program makes it easy to link data in the plot to the table in the data list box by highlighting selected points and planes in yellow, an effect I call the “selection halo”. If you click on a point in the plot, the row will be selected in the table, and clicking on a row provides a selection halo in the Plot Window. You can multiple, non-contiguous selections in the table of the Data List pane by command clicking the rows of interest. From the Data Menu, or equivalent popup menu in the Data Drawer accessed by right-clicking, you can toggle on or off selected data.

The Toggle On and Off commands in the Data Menu can be very powerful when combined the ability to sort rows by clicking on a column in the table of the data list pane. The first time you click a column heading all the rows will sort ascending, the next click will sort descending. To return to the original sorting, click the “No.” heading of the column farthest to the left. Once sorted by whatever criteria you want, you can then select the range of rows that fits your criteria and Toggle Off the rest of the data set.

Plotting Your Data

Stereonet 7 will plot whatever options are checked in the Plot menu. Select a plot type once to turn it on and a second time to turn it off; the plot will automatically change to reflect your selections. If a plot option is checked at the time of data entry, the points (or great or small circles) will appear interactively as you enter each datum. The same plotting options are applied to all checked date sets in the Data Set pane. For example, turning on scatter will make a scatter plot for all lines data sets. If you do not want a data set to appear in a plot, then turn it off by unchecking it in the Data Set pane. As described above, only data that are checked in the Data List Pane will be plotted.

Plotting is specific to data set type. For example, you cannot contour a Planes data set, even though you can display planes as poles. To produce a contour diagram of poles to planes, you must first make a Lines data set containing the poles, which you do by choosing “Poles” from the Calculation Menu.

Some of the options in the Plot menu write the results of the underlying analysis to the Analysis Pane. For example, if you choose Mean Vector from the Plot menu, the mean vector statistics will also be written to the Analysis pane. At any time, you can

erase extraneous information that you don't need from the Analysis pane by selecting it and pressing the delete key on the keyboard.

Changing the Appearance of Your Plot using the Inspector

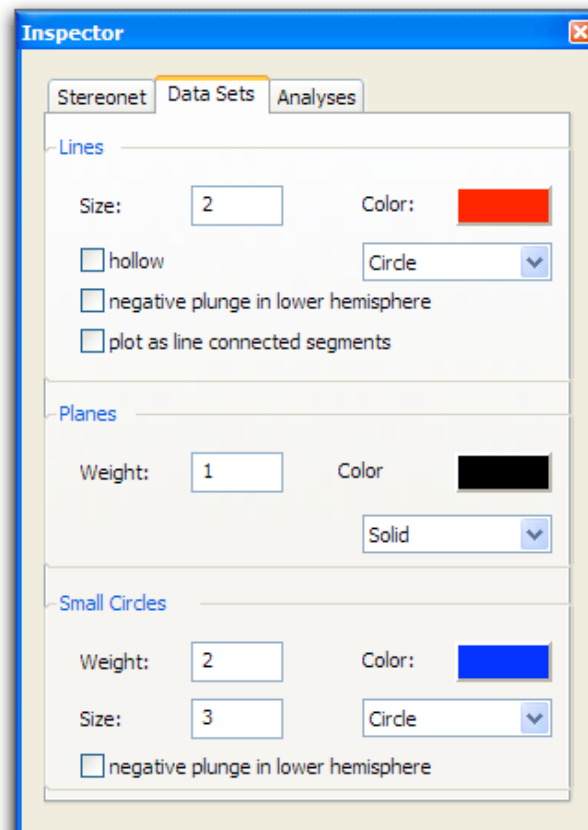
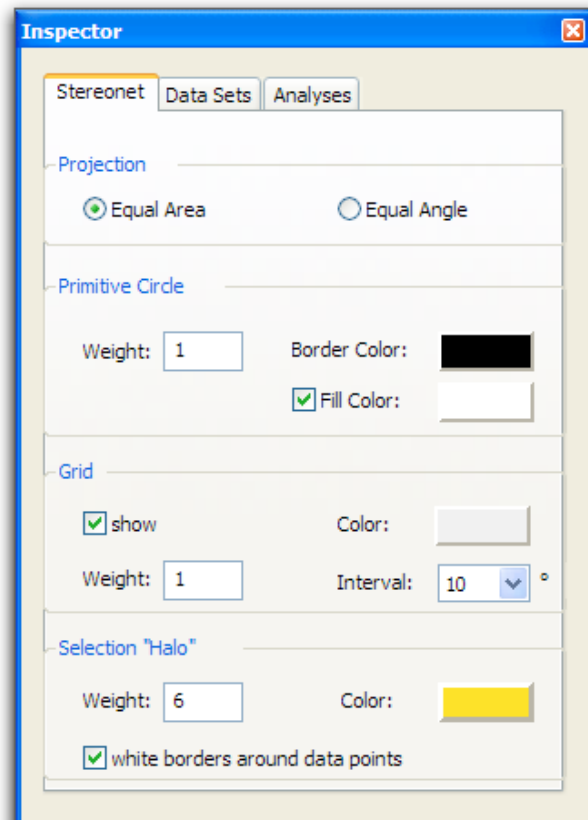
The appearance or formatting of your plot, including the type of projection (equal area or equal angle) is controlled by the Inspector, which is accessed from the View Menu. There are a large number of choices in the Inspector, thus giving you many options for formatting the plot to your liking. Any change that you make in the Inspector is immediately reflected in the plot. [Some of the options on the tabs are not yet functional. Additionally, when contouring is implemented, a fourth tab panel will be added.]

Stereonet Tab

The first tab of the Inspector controls the appearance of the stereonet, itself. Here, you can set the projection, grid spacing, colors, etc. You can turn off the grid or the fill color for the stereonet. To change a color, click on the beveled color box to get the standard Windows color picker in order to chose a new color.

Data Sets Tab

The second tab controls the appearance of individual data sets. The changes you make in this tab apply only to the data set that is selected in the Data Set Pane. If you have three lines data sets entered, only the one that is selected will acquire the properties that you enter. If a

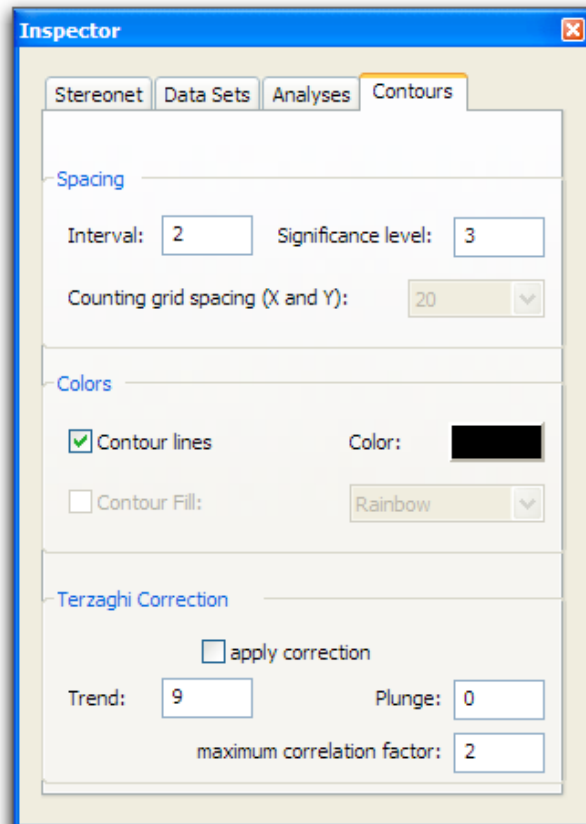
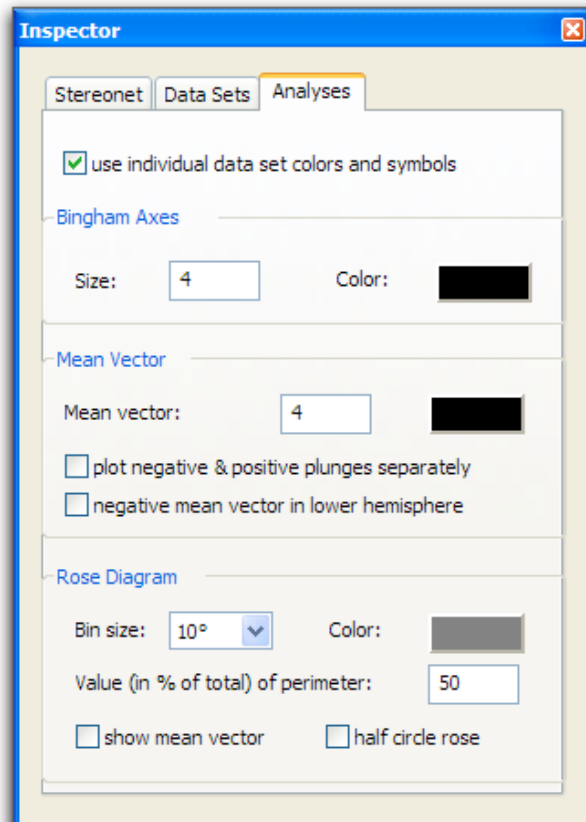


lines data set is selected and you try to change the appearance of planes, nothing will happen because the planes data set was not selected. Lines can be assigned one of four different symbol types, either hollow or solid, and can have any color. “Plot as connected line segments” only applies if you have entered a latitude-longitude data set (line format type 3). Lines can have either positive (lower hemisphere) or negative (upper hemisphere) plunges. Stereonet 7 always plots negative plunges with the same symbol and color, but opposite hollow-type than positive plunges. For example, if a single lines data set is set to use hollow triangles, any negative plunges will be plotted as solid triangles (or vice versa). You can choose to plot negative plunges in either the upper or the lower hemisphere, but they will still have the opposite hollow setting from the positive plunges in the data set. Small circles always break across the primitive, but you can select to plot the small circle entirely in the upper or the lower hemisphere.

Analyses Tab

The third tab controls the appearance of various types of analyses that you can apply to your data such as Bingham Axes (Cylindrical Best Fit), the mean vector, and rose diagrams. If the “use individual data set colors and symbols” is used” the colors that you set here will be overridden by the existing colors which have been set for the individual lines and planes files. This is a global setting for all analyses on this tab.

If your data set has both positive



and negative plunges, as is common with paleomagnetic data sets, you can choose to plot a separate mean vector for positive and negative populations, and chose to plot the negative mean vector in the lower hemisphere. Doing so would be equivalent to performing a paleomagnetic reversal test.

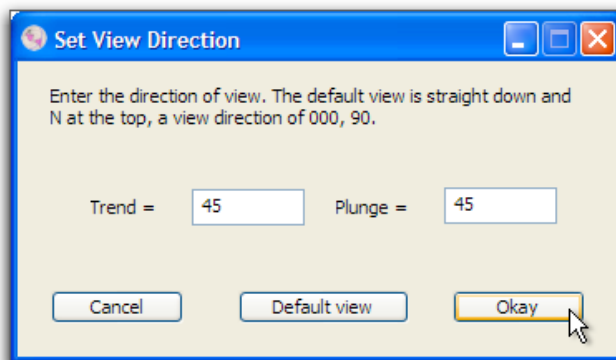
Contour Tab

The fourth tab is where you control the appearance of your contour plots. Like the items on the Analyses Tab, changes in the Contours Tab apply to all lines data sets. If you want to plot the contour lines with the same color as used for the different lines data sets, make sure that “Use individual data set colors and symbols” at the top of the Analyses Tab is checked. The contour interval is appropriate to both Kamb and 1% area contouring, but the significance is only pertinent to the former. You can turn on or off contour lines with the checkbox of that name. Color sets the color for the contour lines (for all data sets) assuming that it is not overridden by the “Use individual data sets colors...” checkbox. Eventually, you will be able to fill the regions between contour lines with solid colors, but that has not yet been implemented. The Contour fill checkbox will control that choice.

The Terzaghi Correction is intended for data that you sample along a 1-D linear transect (borehole, etc.), which can be biased by the fact that you are very unlikely to sample a representative number of structures that trend sub-parallel or parallel to your sampling line. As Randy Marrett explained it to me, to apply the Terzaghi correction for this bias, you just multiply the value at each counting node times $1/\cos(\text{angle between the sample line and the counting node})$. The trend and plunge that you enter in the Inspector’s Contours Tab gives the orientation of the sampling line or transect. Counting nodes that are parallel to the sample line should have a value of infinity, but that would result in an awful lot of contours, so you must specify some upper maximum value, the default value being 10.

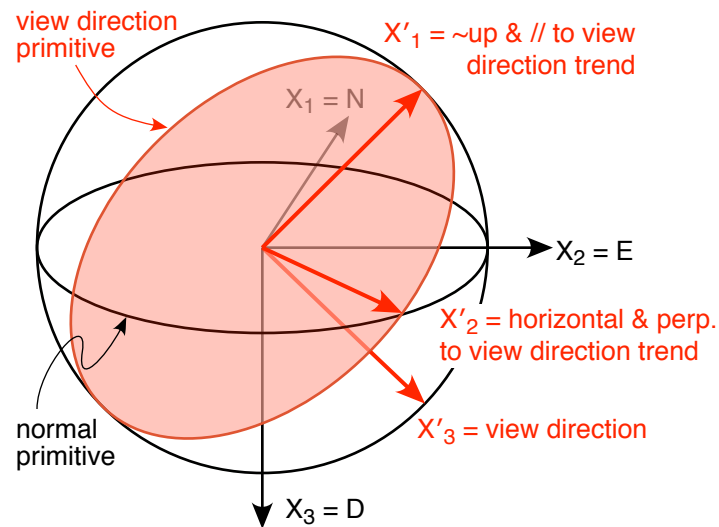
Changing the View Direction of Your Plot

Structural geologists are accustomed to viewing the stereonet as a lower hemisphere projection, as if one were looking vertically downward. However, there are many times when a different frame of reference is better. For example, you may want to plot data in the plane of a cross section (a view direction which is horizontal and perpendicular to the azimuth of the cross section), or in the profile plane (down plunge view) of a cylindrical fold (a



view direction parallel to the fold axis). Of course, you can do this by rotating all your data, but it can be a bit tedious, and you don't have any visualization aids. Stereonet now allows you to set any view direction without having to rotate all of your data.

When you choose "Set View Direction..." under the plot menu, the above dialog box will appear. The trend and plunge that you enter in this dialog will become the new center of the projection and the primitive plane perpendicular to that direction. You can easily return to the default view of North-East-Down by clicking the "Default View" button in the set view dialog box. You do not need to enter any values first. The following diagram shows the relationship between the Cartesian coordinates of a normal geographic stereographic projection (in black) and those of the new view (in red).



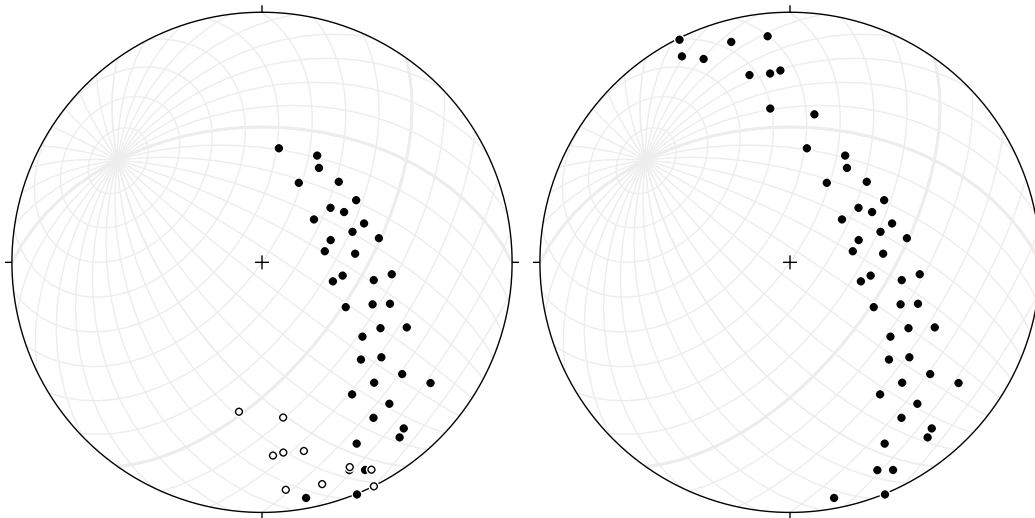
The new view coordinate system axes are plotted at the same position as the old axes. For example, the new X'_3 is plotted in the center of the net at the same place as the old X_3 . Stereonet does not modify your data in any way; you will see no change in the orientations in the Data List box.

To maintain a sense of orientation, I highly recommend that you have "Show Grid" turned on in Preferences; Stereonet will then plot the rotated grid, with the great circles intersecting at the north or south pole. This essentially lets you see both coordinate systems at once. For the values shown in the above dialog, the rotated grid with the new and old coordinate systems, is shown below. Note that for the entered values, X_1 , X_2 , and X_3 are all positive, but other view directions can result in negative axes being plotted.

When you click and hold down the mouse on the stereonet, the orientation that you see is in geographic coordinates. That is, if you click on the pole in the above diagram, the trend and plunge will show "T&P = 0, 0", or perhaps "T&P = 360, 0". This is the fastest way to determine whether or not the pole showing is north or south (the latter, of course, will have a trend of 180°). Clicking on points above the horizon will show

negative plunges, because these points are plunging upwards into the upper hemisphere, negative by standard structural convention. If you hold down the shift key while you click on the stereonet, you will see the trend and plunge of the clicked point in the new view coordinate system. It is unlikely that you will need this very often!

One potentially confusing aspect of this new capability is the concept of “upper” and “lower” hemispheres. Once you set the view direction, the upper hemisphere is the one in the direction opposite to the direction in which you are looking. Lines that plunge downward geographically (and thus have positive plunges) may well end up in the “upper” hemisphere of the new view. When you choose Scatter or Mean Vector, Stereonet will ask you how you want to handle these “upper” hemisphere lines. The figure below shows the same data set plotted in geographic coordinates (left) and with a view direction of 045°, 37. Note that some of the lines in the left hand graphic have become “upper” hemisphere (to the new view direction) because of the coordinate transformation. In the right, “Plot negative plunges in lower hemisphere has been selected:



Calculations and Data Analyses

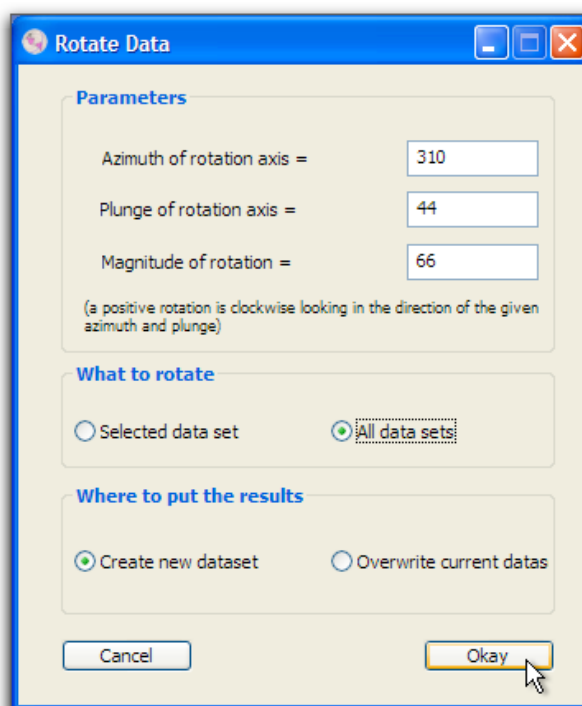
Pole to Planes, Planes from Poles

These two options produce new data sets. In the case of Poles to Planes (if a planes data set is selected in the Data Set Dialog) or Planes from Poles (if a lines data set is selected), a new data set is always created with a name taken from the original data set preceded by “poles to...” or “planes from...” Note that, *to contour poles to planes there must actually be a Lines data file which contains the poles*. Although you can plot planes as either great circles or poles, you cannot contour a Planes data set.

Rotate Data

Your data can be rotated about an axis of any orientation. Rotation magnitudes are positive if they are clockwise looking in the direction of the given azimuth and plunge of the rotation axis, and negative if they are counter-clockwise. The data are always rotated as vectors: If the rotation produces a line with a negative plunge (pointing into the upper hemisphere), it will not be converted into a lower hemisphere line.

As shown in the rotation dialog box to the right, you have the choice of rotating just the selected data set or all of the data sets in the Data Sets Pane. Additionally, you can specify that the rotation replace the existing data sets or that new data sets be created. The screen capture to the right shows the results of rotating all entered data and placing them in new data sets.



	Data Set Name	Type	Format
<input checked="" type="checkbox"/>	Corral Quemado Paleomag	Lines	1
<input checked="" type="checkbox"/>	Girdle lines	Lines	1
<input checked="" type="checkbox"/>	BreeCreekNWBdg.txt	Planes	1
<input checked="" type="checkbox"/>	SAM outline	Lines	3
<input type="checkbox"/>	rotated Corral Quemado Paleomag	Lines	1
<input type="checkbox"/>	rotated Girdle lines	Lines	1
<input type="checkbox"/>	rotated BreeCreekNWBdg.txt	Planes	1
<input type="checkbox"/>	rotated SAM outline	Lines	1

Fisher Vector Distribution & Bingham Axial Distribution

These statistical analyses are carried out on the selected lines file in the Data Set Pane and the results written to the Analyses Pane. No data sets are modified in any way. The former is the same analysis used in the mean vector calculation whereas the latter is used in the cylindrical best fit analysis where the polarity of the vectors is unimportant. See Allmendinger et al. (2012) for a complete description of these routines.

Angle between...

If two lines are selected in a data set you can choose to calculate the angle between them, which is essentially the angle in the plane that contains both lines. Both the angle and the two lines selected will be recorded in the Analysis pane.

If two planes are selected in the same data set, the program will calculate not only the angle between the two planes but the line of intersection as well. The result will be written to the Analysis pane

```
-----Angle between Lines | 8/10/2011 at 10:18 PM-----  
Angle = 27.1° or 152.9°  
Line of intersection = 016.7, 12.4  
Planes selected (RHR): 347.0°, 24.0° and 259.0°, 14.0°
```

Finally, you can also use the mouse to click on two points inside the stereonet and the angle between those two points will be displayed in a dialog box and you will be given the option of writing the results to the Analysis Pane.

Direction Cosines

This command will write out the direction cosines of any selected lines, or the poles to any selected planes, to the Analysis Window. The entries are tab separated, making it easy to copy the results from the Analysis pane and paste them into a spreadsheet or other document:

```
----- Direction Cosines | 8/10/2011 at 10:38 PM-----  
Data set: Corral Quemado Paleomag  
Datum      Trend    Plunge    North     East      Down  
15          024.9    -46.7     0.622     0.289     -0.728  
29          212.2     37.9    -0.668    -0.42      0.614  
52          339.3    -59.7     0.472    -0.178     -0.863  
59          200.      45.7    -0.656    -0.239      0.716  
  
----- Direction Cosines | 8/10/2011 at 10:39 PM-----  
Data set: BreeCreekNWBdg.txt  
Datum      Strike   Dip       North     East      Down  
1           201.    49.      -0.27     0.705     0.656  
3           340.    25.      -0.145    -0.397     0.906  
15          199.    49.      -0.246     0.714     0.656  
[direction cosines are for the poles to the planes]
```

Copying, saving and printing your plot

Once you have the plot just as you like it, you can save it as a PDF file for import into other programs. The PDFs produced should be of publication quality and should appear identical to, but higher resolution than, the plot window itself. The size of the pdf is controlled by the size of the Plot tab in the Main window.

Alternatively, you can save your plot in an older vector format by choosing “Save Plot as PICT/EMF” which will save the plot as an enhanced metafile format in Windows. PDF output is superior to PICT/EMF and is thus highly recommended¹.

Stereonet 7 also supports the clipboard. If any text is selected in either the Data List or the Analysis Pane, that editable text will be copied to the clipboard. Otherwise the Graphic in the Main Window will be copied as vector objects to the clipboard for pasting into another application. The application into which you paste the graphic will determine the format in which it appears. In Mac OS X, Cocoa applications, it will usually appear as a Tiff image, whereas Carbon apps will recognize the vectors. The clipboard uses .EMF quality graphics and thus should not be used for final production work if you can help it.

Stereonet 7 has a very basic printing routine which will print the graphics in the Plot pane, again using .EMF quality graphics. At present, the graphic is printed at the size it appears on the screen unless it is larger than 7 inches, in which case it is shrunk to fit the screen. The default size of the graphics window produces a stereonet that just fits on one page. The text in the Analysis Window/Pane is automatically added beneath the stereonet. On the Mac OS X, you can print to PDF as you can in other programs, however, the pdf that is produced by the save plot as pdf command is higher quality than that saved from the print window.

Interactive Features

- Whenever the mouse moves over the stereonet, the trend and plunge at the tip of the cursor is displayed in the lower left corner
- Clicking and dragging the mouse inside the stereonet temporarily displays a great circle whose pole coincides with the tip of the cursor.
- When “Enter with mouse” is checked under the Data Menu, you can enter data by clicking and dragging the mouse inside the stereonet. Hold down the Shift Key to enter Lines; hold down the Alt Key to enter Planes.

¹ I have had reports that PDF output does not work on German systems. If that is the case, just switch your system to US English for long enough to save the plot as a PDF.

- Clicking on a data point in the stereonet selects the corresponding row in the data table and vice versa. Multiple, noncontiguous selections are possible
- Changes made in the Inspector are instantly reflected in the plot

Version History

Version 7.2.0 — 2011.11.07

- Major new features: enter data with mouse by clicking and dragging inside the stereonet.
- Fixed bug where window not resized correctly when reading in a binary file
- Fixed bug where program tried to draw error cone even when normalized mean vector length was <0.65

Version 7.1.6 & 7.1.7 — 2011.10.26

- Planes can now be drawn as either solid or dashed lines
- If only rose diagrams are showing, the equal area angle grid is not displayed. Instead equally spaced concentric circles, at either 5 or 10 percentage intervals, and spokes at 10° intervals are drawn and labeled as a scale for the rose diagram. This happens automatically and only when rose diagrams and nothing else are displayed. The value at the primitive is controlled by the entry in the Inspector Analysis tab.
- The outer edge of rose petals are now drawn as an arc rather than as a single straight line segment, which is much more attractive!
- Plot mean vector on rose diagrams has been enabled
- Fixed some interface bugs related to showing or hiding the data panels
- Significantly speeded up selecting tabs in the Inspector -- Yay!

Version 7.1.5 — 2011.09.12

- You can now hide the data set list and data list panes by toggling a disclosure triangle or from the Windows Menu. This makes the overall window narrower, which might be of help for people on small screens or if, for some reason, you want to hide the data.
- Various optimizations to improve performance selecting from the Data set list. The Inspector also appears more rapidly, though selecting tabs remains sluggish (sorry...)

- Fixed a bug where reading in a binary file that was saved with a view plunge of 90 degrees would be read in with a view plunge that wasn't exactly 90 degrees
- Fixed a bug associated with calculating poles from planes and planes from poles
- Planes can now be visualized as great circles and poles simultaneously

Version 7.1.2 — 2011.09.12

- Cylindrical best fit now draws the best fitting plane and writes its orientation to the Analysis text pane,
- When you add a new data set, the appropriate plot type is automatically selected so you see your data plotted as you enter it. E.g., if you select new lines, Scatter will be turned on in the Plot Menu, etc.
- Preferences dialog box has been added to allow the user to set their preferred default data format and stereonet format settings.

Version 7.1.1 — 2011.08.30

- Fixed a bug in the Dip, Dip Azimuth (DD) format for planes. Previous versions did not handle this format correctly
- Added uncertainty calculations to the cylindrical best fit/Bingham statistics
- Disabled pop up menu for planes style in Inspector because those options have not yet been implemented
- minor bug fixes

Version 7.1.0 — 2011.08.21

- Drawing contour lines has now been implemented. You can now do either Kamb or 1% area contouring by selecting one of those options in the Contour submenu of the Plot Menu.
- Contour lines are saved to PDF files and EMF files, they will print, and they are copied to the clipboard with the rest of the plot
- Contours do not yet have a fill pattern. Those options have been turned off in the Contour tab of the Inspector
- Lots of little bug fixes.

Version 7.0.4 — 2011.08.18

- Yet another new binary data format. Previous files will not read in correctly, so I hope that you have been exporting your data as text files!
- Stereonet can now handle input data of lines as rakes (pitches) on planes. To enter a new data set, hold down the shift key while clicking on the +L button. This will cause both a new lines and a new planes data set to be entered. These data sets should have the same name. The two letter format code for such data sets is “RK”.
- The format code in the Data set list box has been changed to a two or three letter code, identical to that shown in the table in earlier int eh users manual and as used by earlier versions of Stereonet.
- Changing the format code in the Data set list box will now change the format of the data listing.

Version 7.0.3 — 2011.08.17

- New binary file format. It will read the old format with only minor glitches in the analysis text. Nonetheless, you should re-save all of your binary files.
- Interface for contouring has been put in place (e.g., the Inspector now has a Contours tab) but contouring itself still does not work.

Version 7.0.2 — 2011.08.16

- minor bug fixes and behavior changes
- more predictable Inspector behavior

Version 7.0.1 — 2011.08.15 -- Initial beta release!

Things that are known not to work in this release

- Contouring has not yet been implemented
- Set view direction does not work with latitude-longitude plots. This means that you are effectively limited to viewing continents in the Western Hemisphere
- Conical best fit has not yet been implemented
- Adding lines by their rake in a plane has not yet been programmed
- There is no way (yet) to combine data files, either by appending them to existing data sets or by or by copying and pasting between data sets
- Plotting small circle in the upper hemisphere is broken

- Variable rotation (e.g., by unfolding lines associated with bedding) has not yet been implemented
- Half circle rose diagrams and plotting mean directions for rose diagrams have not yet been implemented
- Refreshing the data listing does not always work. You may have to click on the data set again to refresh the data listing
- There is no way to control the format of the data listing at present
- There is currently no way to parse an unidentified text file that does not start with the standard two character header from earlier versions of Stereonet.

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