Reference Rotation Control in IMP

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When Partial Warp plus Uniform component scores are calculated in IMP, the Reference Form is always rotated so the principle axes of variation in the specimen align with the x and y axis, for convenience in calculating the uniform components of deformation following Bookstein's approach (1996, the White Book). This will typically result in reference orientations that are other than what one might desire. Additionally, when specimens are displayed in baseline registration (Bookstein Coordinates, BC) or sliding baseline registration (SBR), the baseline by default is always along the x-axis, which may not be desirable.

A Default Reference Rotation

There is now a default rotation angle in all software which draws deformation grids. This angle is in a box labeled *"Default Ref Angle"*. There are two ways to change the default reference angle. You can change it for a single working session for a given piece of software by typing in a new value in this box (remember to hit enter after typing the new value in). You can also change this angle for all the IMP software, for all working sessions by changing the file that stores the default angle for all IMP software.

To change the default angle for all IMP software, use a text-editor (Word, WordPad or Notebook) to open the file *refanglefile.txt* and change the angle within this file to your desired default reference angle. The *refanglefile.txt* file will be located in the /bin/win32 directory where you start your IMP software from. The angle should be 90 the first time you open the file. Change it to whatever default angle seems to be appropriate for your study and save the file. Be careful not to add an extra linefeed or return character to the file when you edit it, that can cause problems when IMP tries to load the file. If IMP can't load the file properly after you edit it, try adding or deleting line-feeds or returns.

Active Reference Rotation Control

In addition to setting the angle in the default reference rotation box, there is an interactive method for controlling reference orientation. There is a radio button (or option button) called *Reference Rotation Active* on the software. Selecting this button will cause the active reference rotation control to be turned on, allowing you to try different rotations of the reference.

Using the Active Reference Rotation Control

When you press the Display (Deformation) button in a piece of IMP software that plots using deformation grids, when the *Reference Rotation Active* button is set, the program will plot the reference form on the display, and then bring up a dialog box that offers you

the ability to rotate the reference form to some other orientation. Enter the rotation of the reference you would like to see, in degrees. A positive angle is a counter-clockwise rotation, negative angles are clockwise. You may perform a series of rotations of the reference to achieve a desired final orientation. Click the Okay button to perform a rotation, which will cause the program to rotate the reference and replot it, offering you the option to rotate it again. When the reference form is in the desired orientation, enter a rotation angle of zero, or hit the Cancel button. The deformation will then be displayed. The program will initially offer you a default rotation angle of 10 degrees for your first plot, on subsequent plots it will offer you the net rotation used in the previous plot, so that if you change plot parameters, you can rapidly reproduce the plot.