

# INTRODUCTION

Start by stating that this mini- guide to the de-rotation of the planetary images using the software WinJupos, wants to be just a tool of "initiation " with which to begin to understand the workings of the "planetary derotation" and not a comprehensive manual which, at least at present, i did not prepare to write it.

Point out that the derotation can be done in several ways: from the original movies, from raw frames (RAW) added, the added frames and pre- processed.

Well, here we will briefly analyze the latter case, namely the frames stacked and pre-processed that initially seemed to me the easiest way but that, in my current opinion, maybe it could also be the most effective.

Anyone forward then, in the other methodologies established or having the best efficacy or other characteristics in this, respect than that which we will discuss now, you should be kind enough to contact me at my email [c.zannelli@virgilio.it](mailto:c.zannelli@virgilio.it) for any useful suggestions and valuable alternative solutions.

Thank you for your interest and.... good luck!

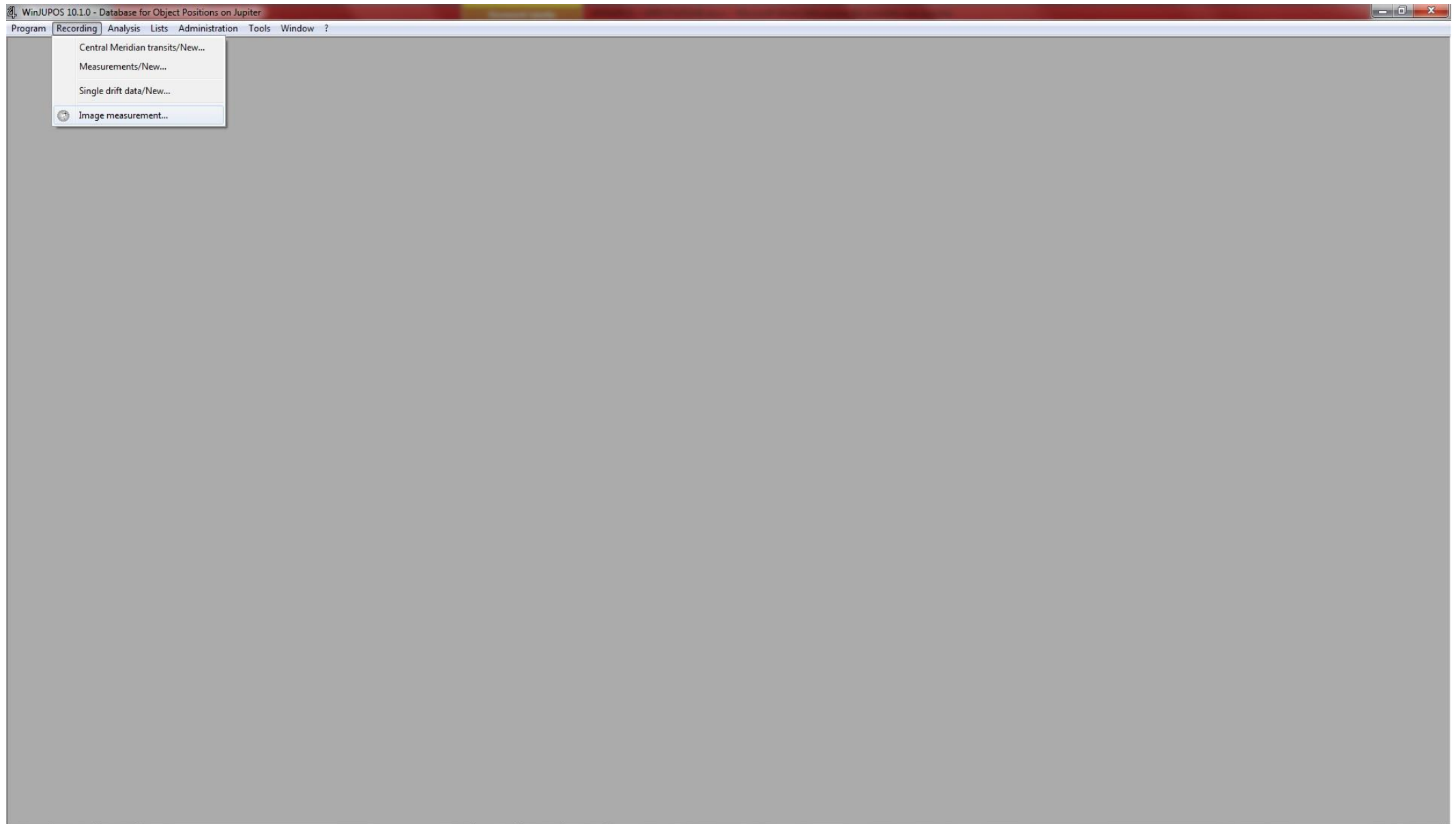
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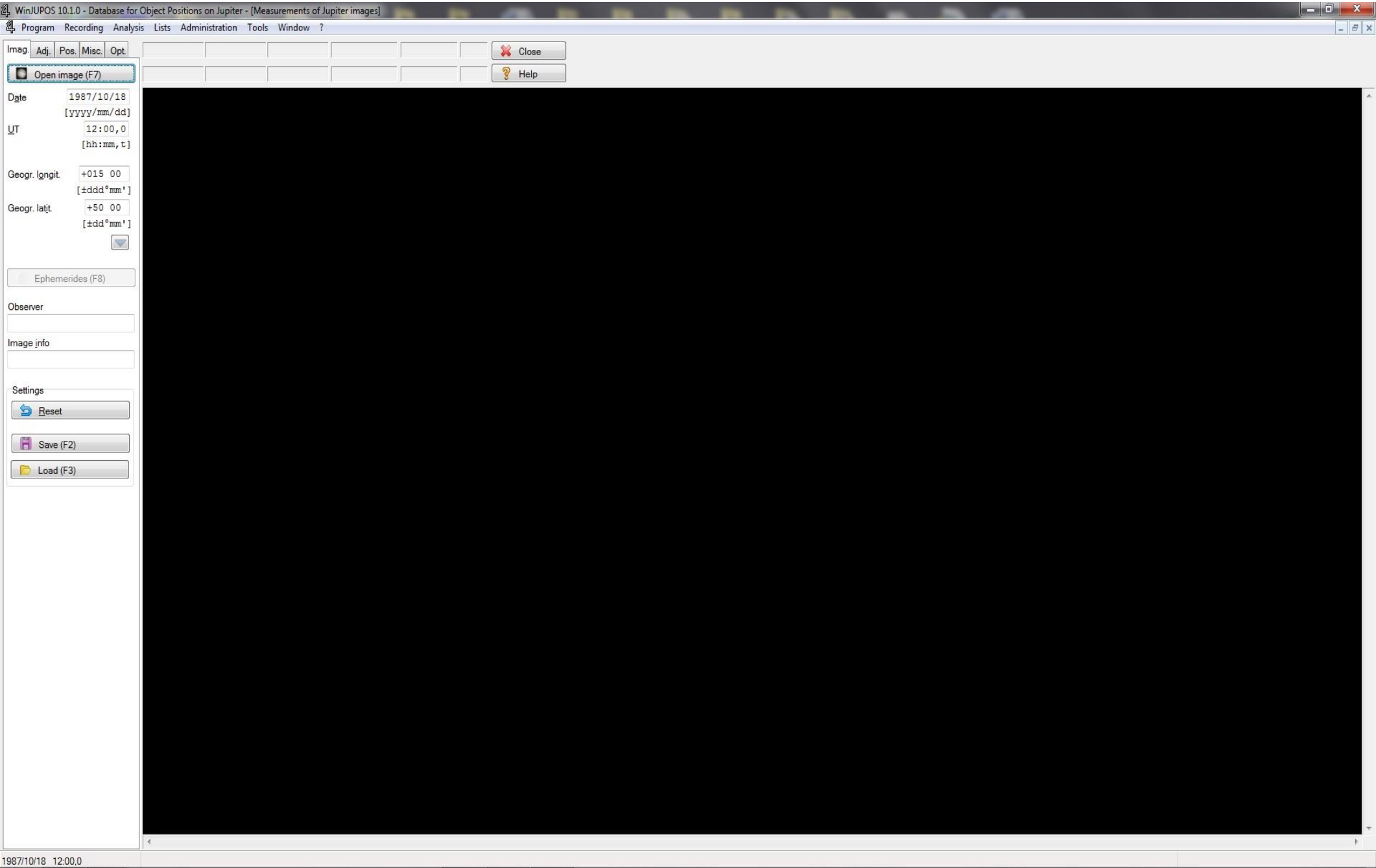
# WinJupos Planetary De-rotation

The main function of WinJupos to complete the derotation is the "measurement" of the planet.

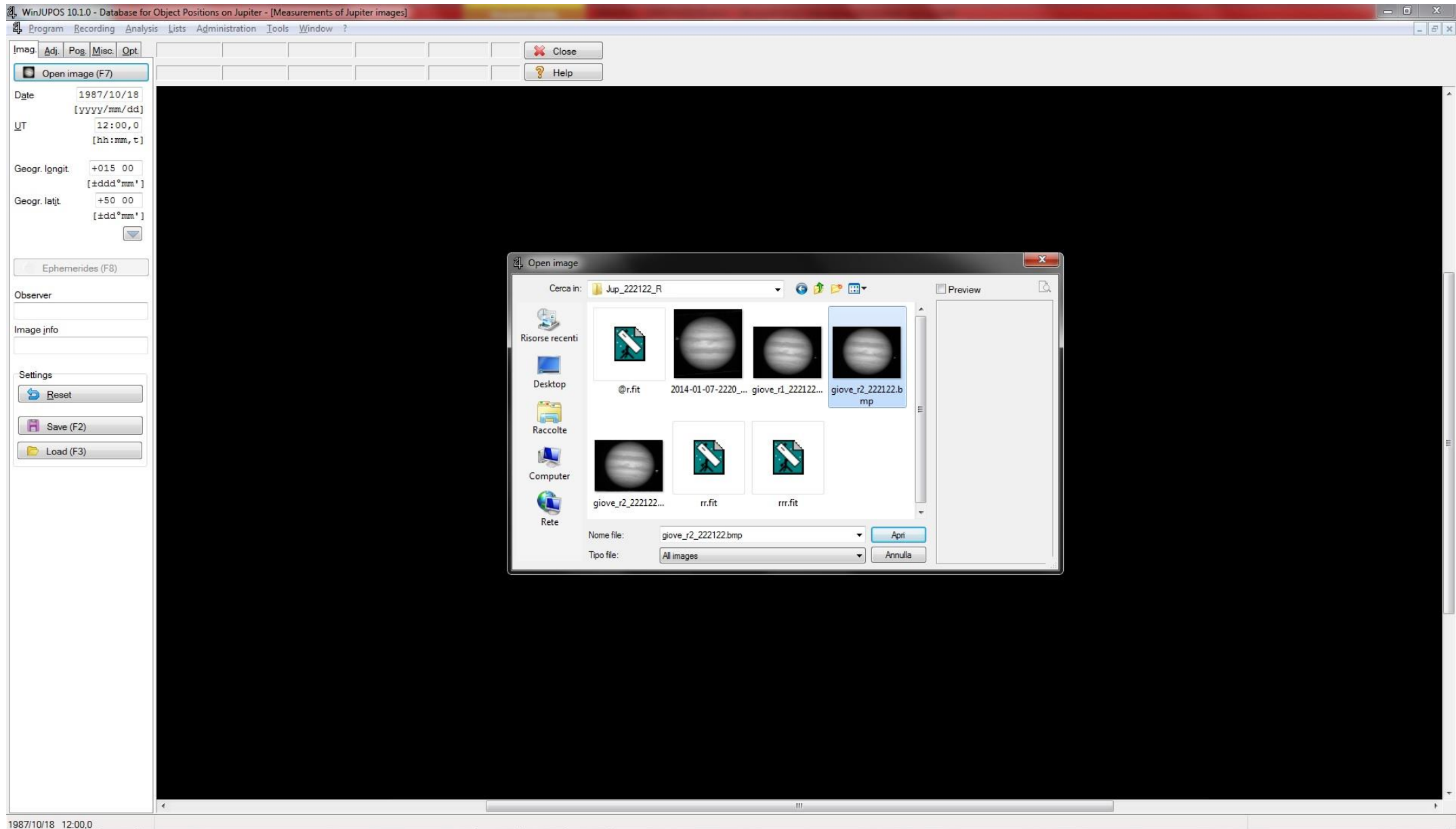
Started the program, choose the planet in question (Mars, Jupiter, Saturn, etc.). Clicking on the "Program" > "celestial body", then go to "recording" > "image measurement".



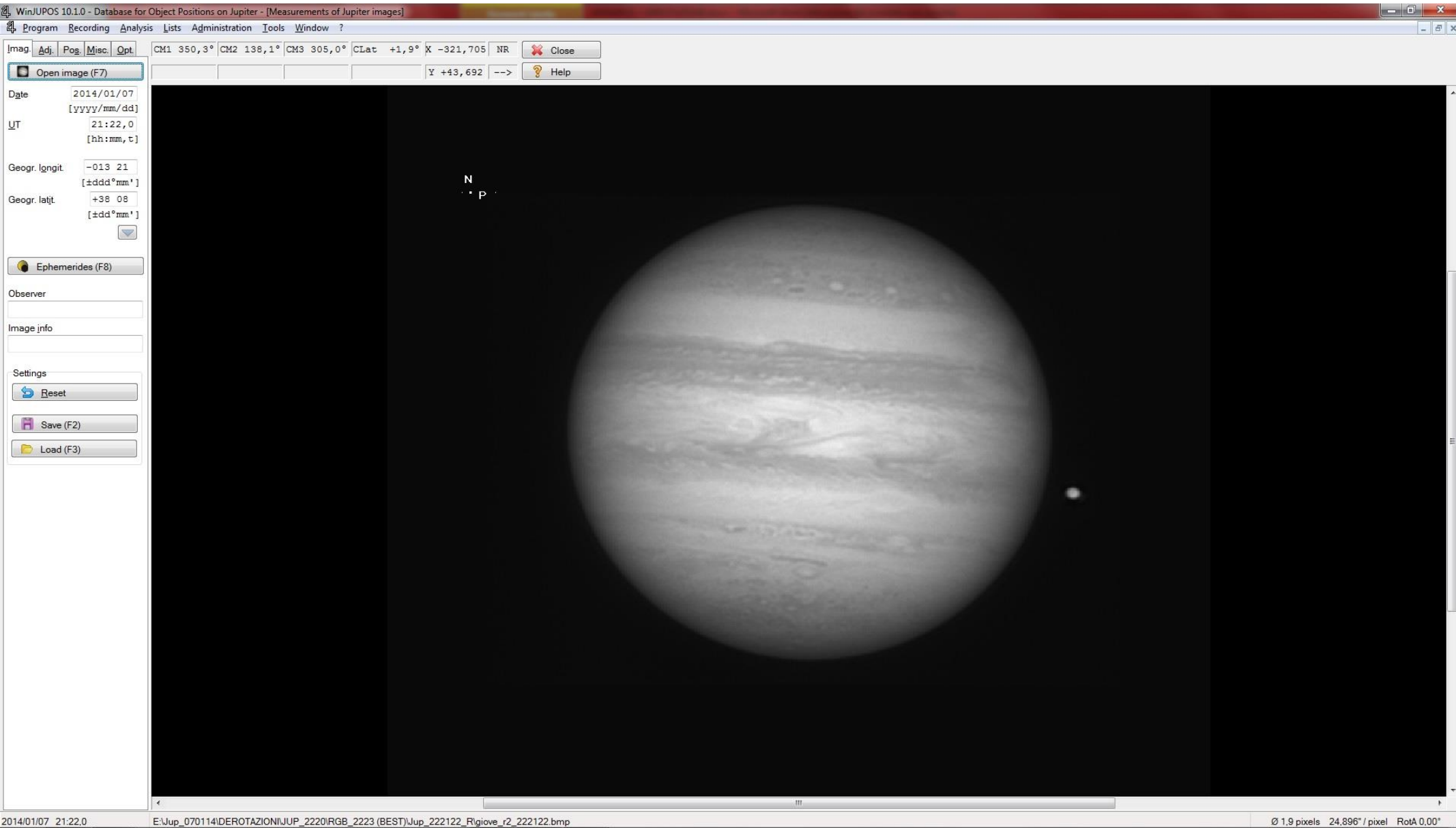
At this point it will open a screen of this type:



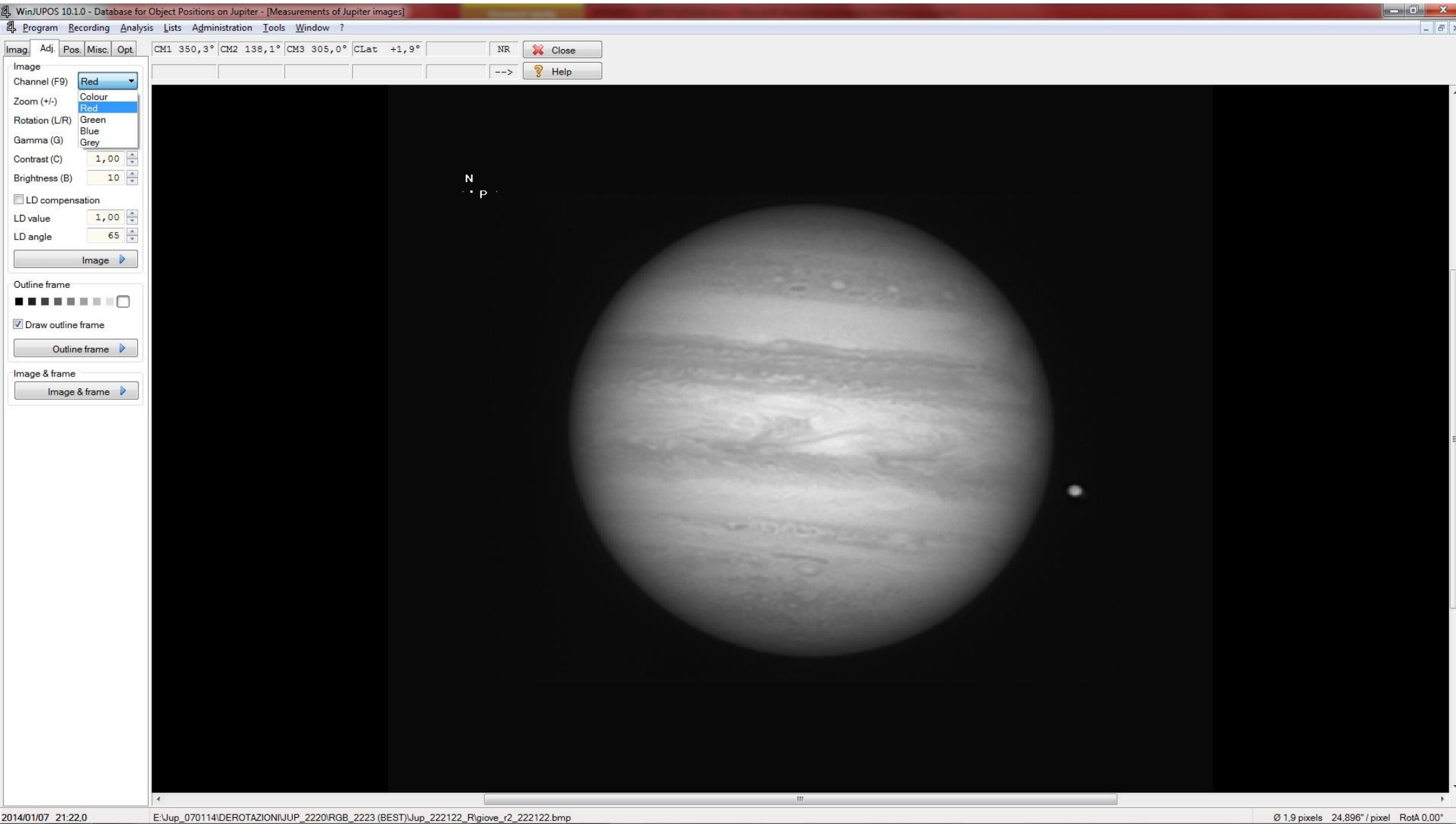
Then go on the "open image" (top left) and choose then, using the path, the image to be loaded from your HDD.



We proceed, then (under the Open Image button) to enter the time parameters (in U.T.) and geographical (in Longitude and Latitude) of your website shooting (for ex: Use for this purpose your smartphone GPS function). I note that for the best outcome of the de-rotation, the time in UT should be placed with the greatest precision, going to enter the "average" time of each AVI (or other extension files) film. In this regard, for those who use me as "Firecapture", just open the text file containing all the data of the movie and go to read the average time of the movie by putting it in the box UT.

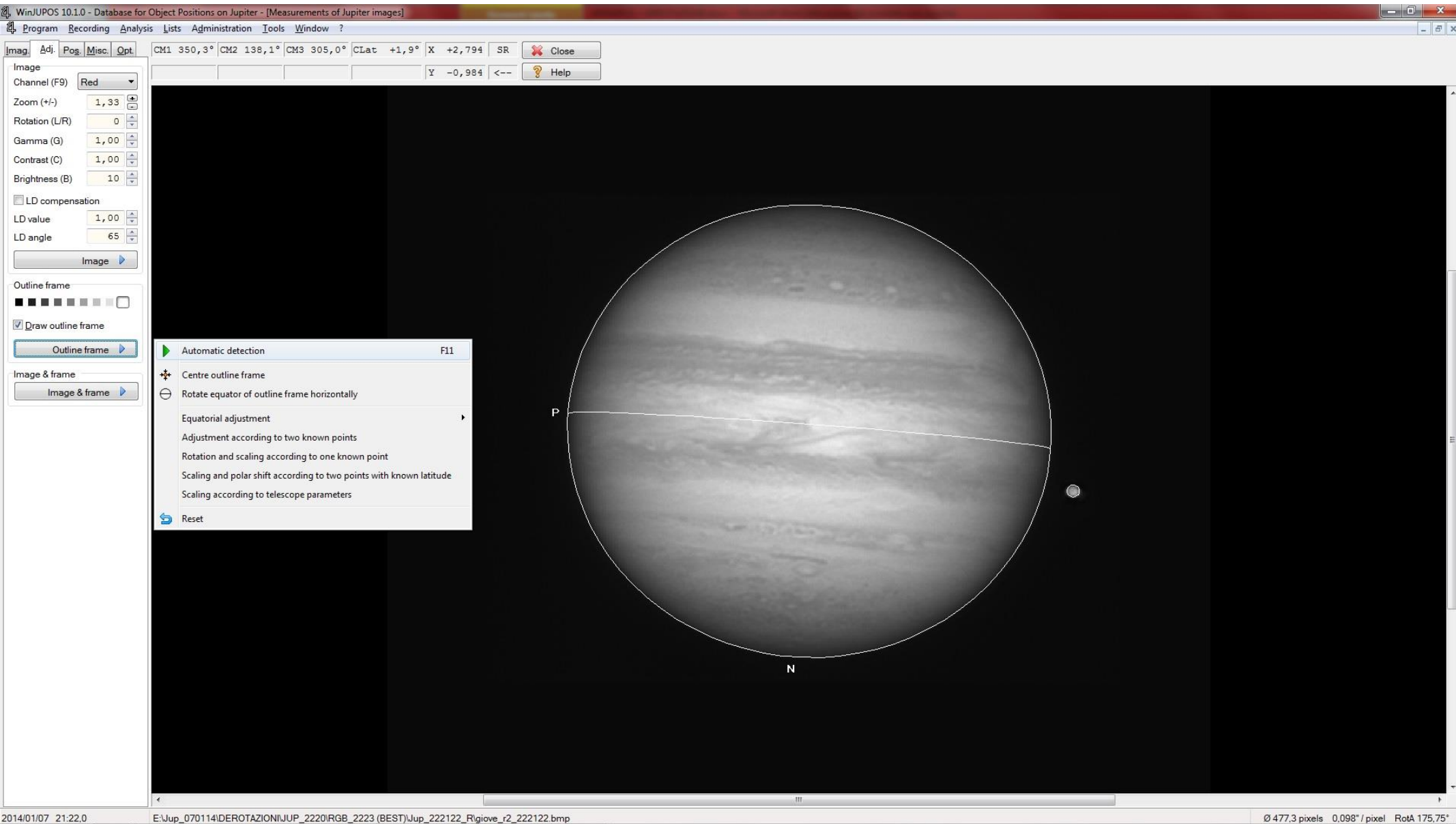


Let us now turn to the window next to Image, namely "Adjust" and go-on to set the type of "channel" we want to make the measurement (in the figure, in this case the R channel)



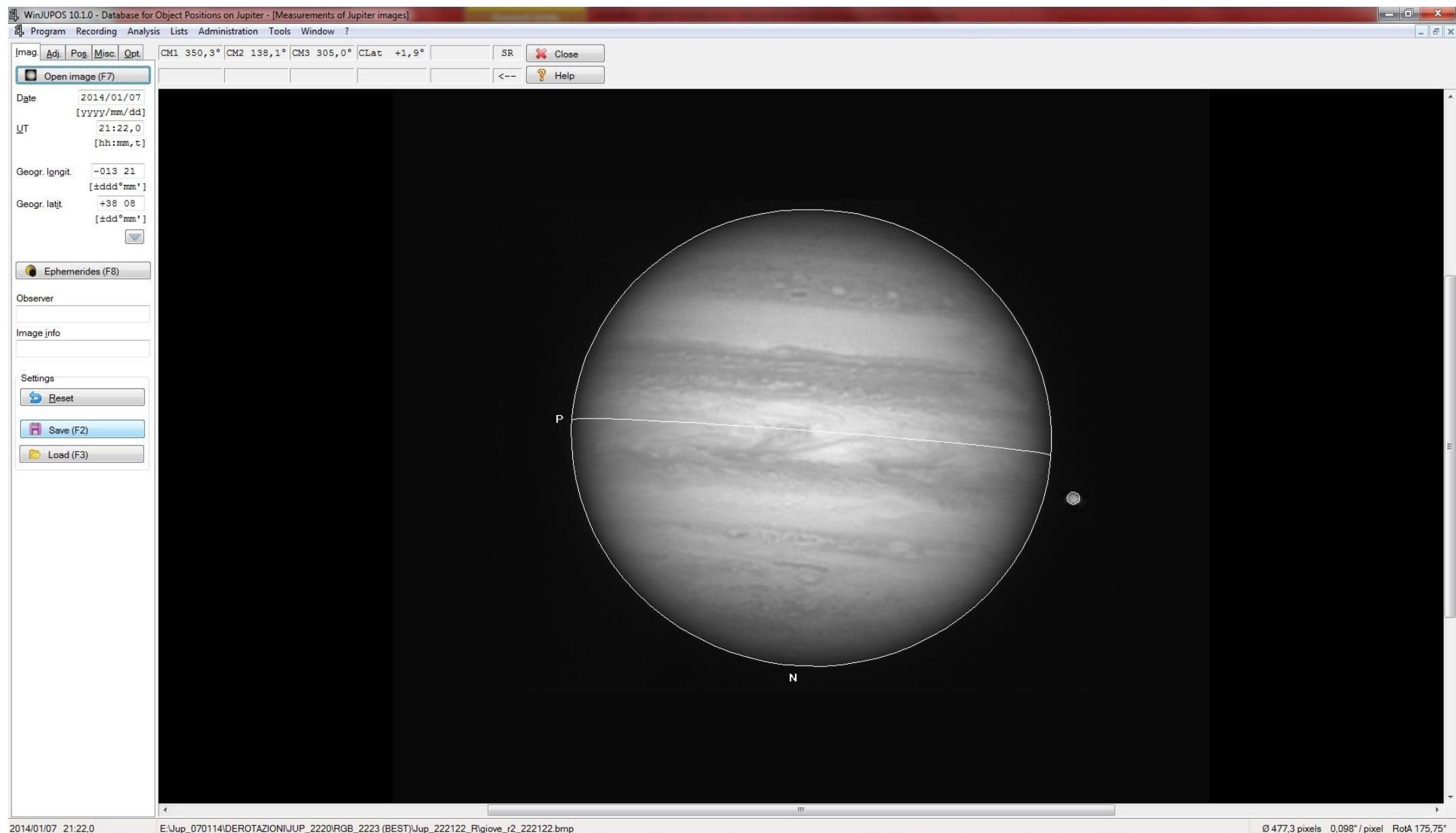
At this point we enter the references delimiting accurately sides of the planet. Before proceeding, I found it useful to visually zoom in slightly with the appropriate key and increase to 10% brightness for better visual feedback on the accuracy of the delimitation of the planet. Therefore remaining on the current window (where we

previously set the image type: in this case Red) Click "outline frame" and again on "automatic detection" (see figure), the software will try to fix the references to the automatic storage points of reference for the de-rotation. Make sure that the resulting orientation is correct (in the figure the north pole is at the bottom and the edge of P on the left). In some cases, as illustrated in this, the presence of one of the Galilean satellites could be a useful reference, but if it were not for this opportunity, just be careful to orient the N in the right direction.



If "Automatic detection" does not work (very rare case if you had the foresight to steer in the right axes), then you have to adjust the position manually using the cursor (arrow) keys to move the image on the 4 axis, and using the "n" and "p" key to rotate clockwise and counterclockwise, and finally the page-up and page-down keys to zoom in or out.

Then entered all the data and performed the automatic-detection (or manual), go to the "Imag." (Always in the upper left.) And click "save", saving the image in the desired format (I use the Png or Tiff format).





We repeat exactly the same process for all the images you want to add and derotate between them, of course, for each channel R, G and B.

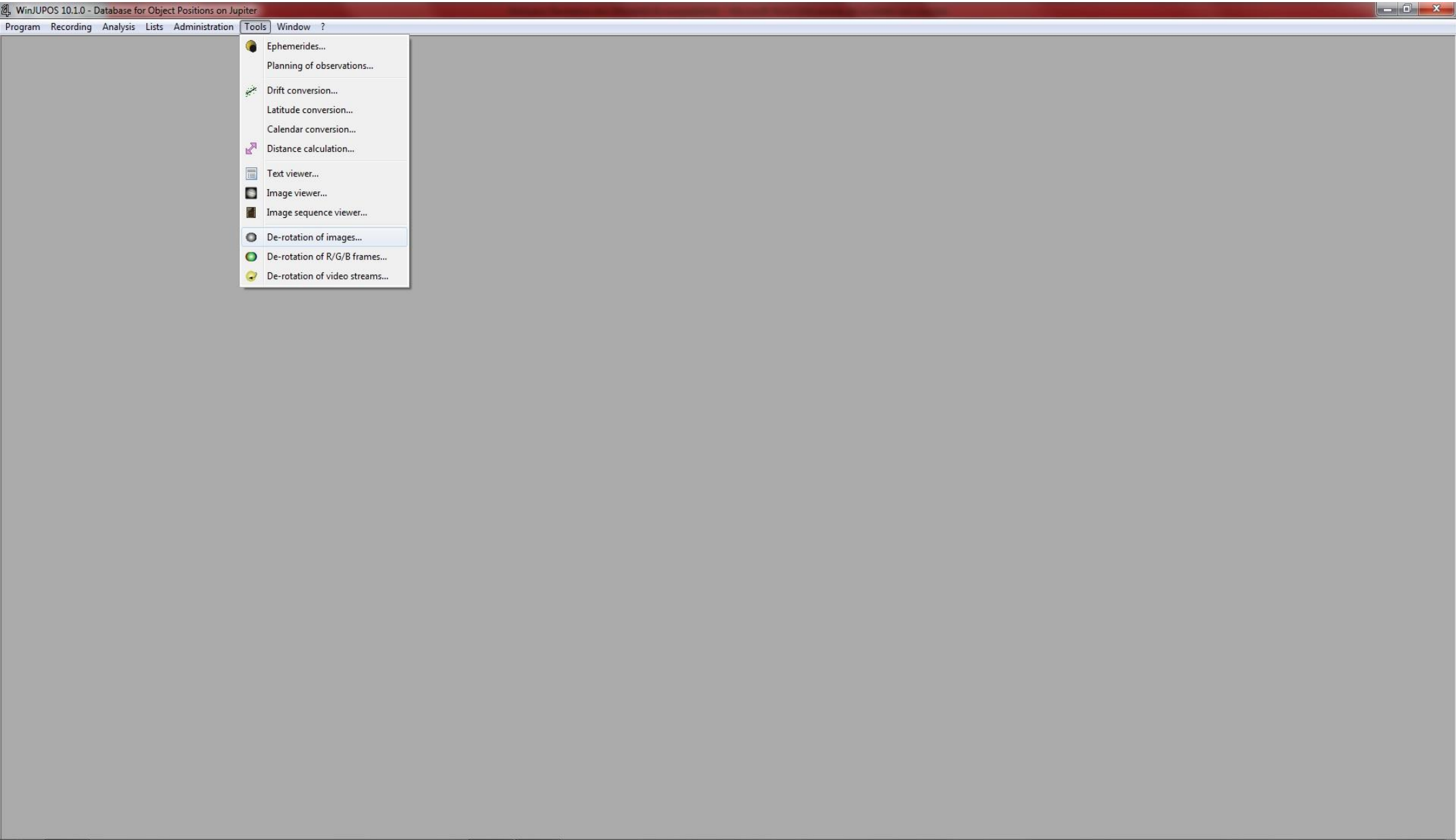
Be careful don't confuse the target folders of files with the extension .ims and don't confuse between the channels R, G and B added together and de-rotated. To do this, just prepare before starting the procedure, the destination folders of image files to work with, and consequently of the files .ims products from the measurement procedure for the de-rotation.

Obviously, I suppose to work on a single channel at a time, and then on a number of acquired films ( for ex: better two or three per channel) maybe separated by a few minutes of each other, but remember that it is not possible to exceed a certain time, otherwise the result becomes too visible de-rotation losing details from the edges to the center as we increase the amount of time and the images to be added and derotate between them.

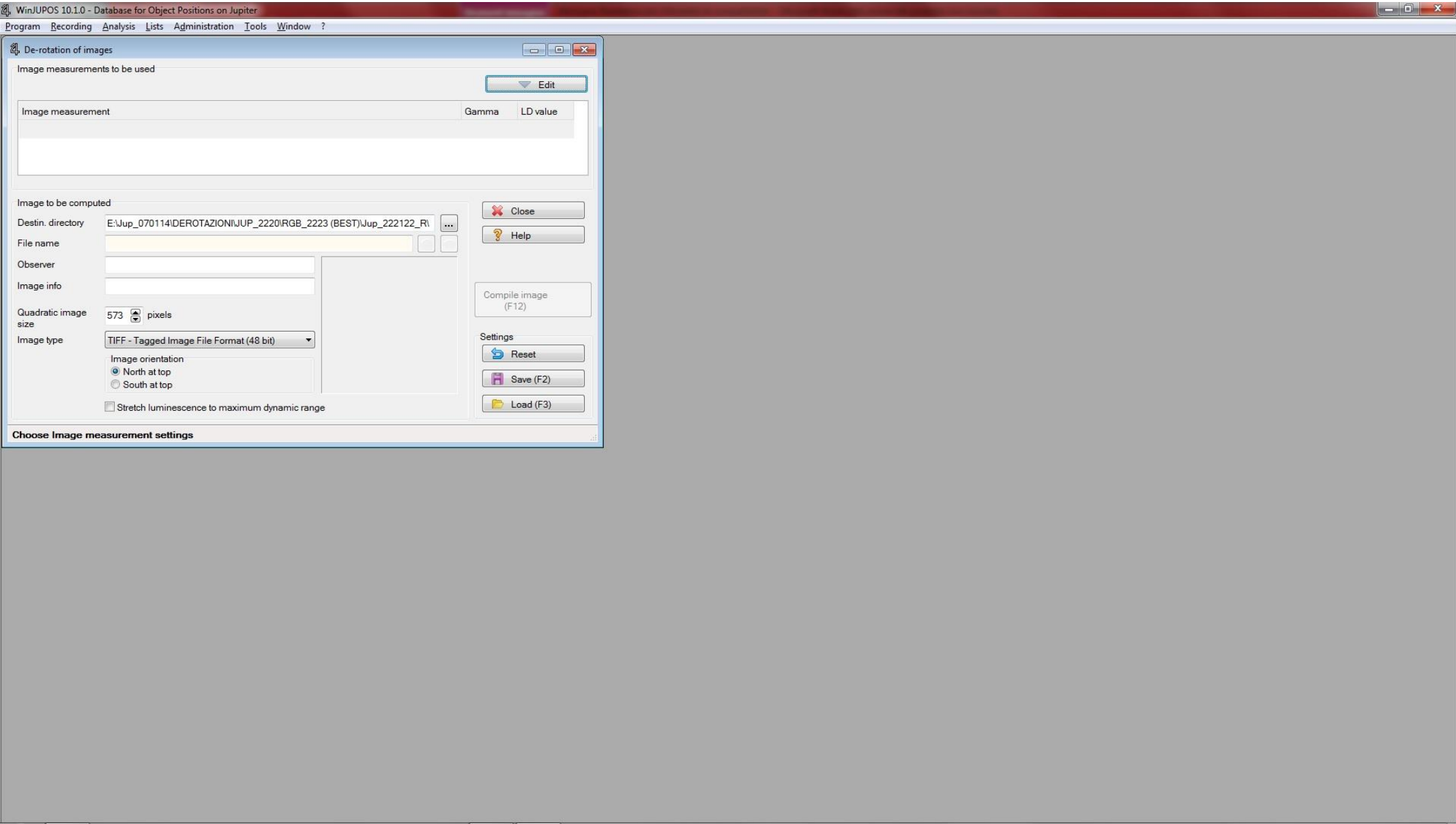
In my (very short) experience and doing some tests, I found the best de-totation result for a total of max. 15 minutes, beyond which it is no longer a clear gain, in fact, you lose detail as indicated above.

So, having saved all the measurements for each channel R, G and B (with .ims extension) we can pass to the famous "de-rotated compile" of individual channels.

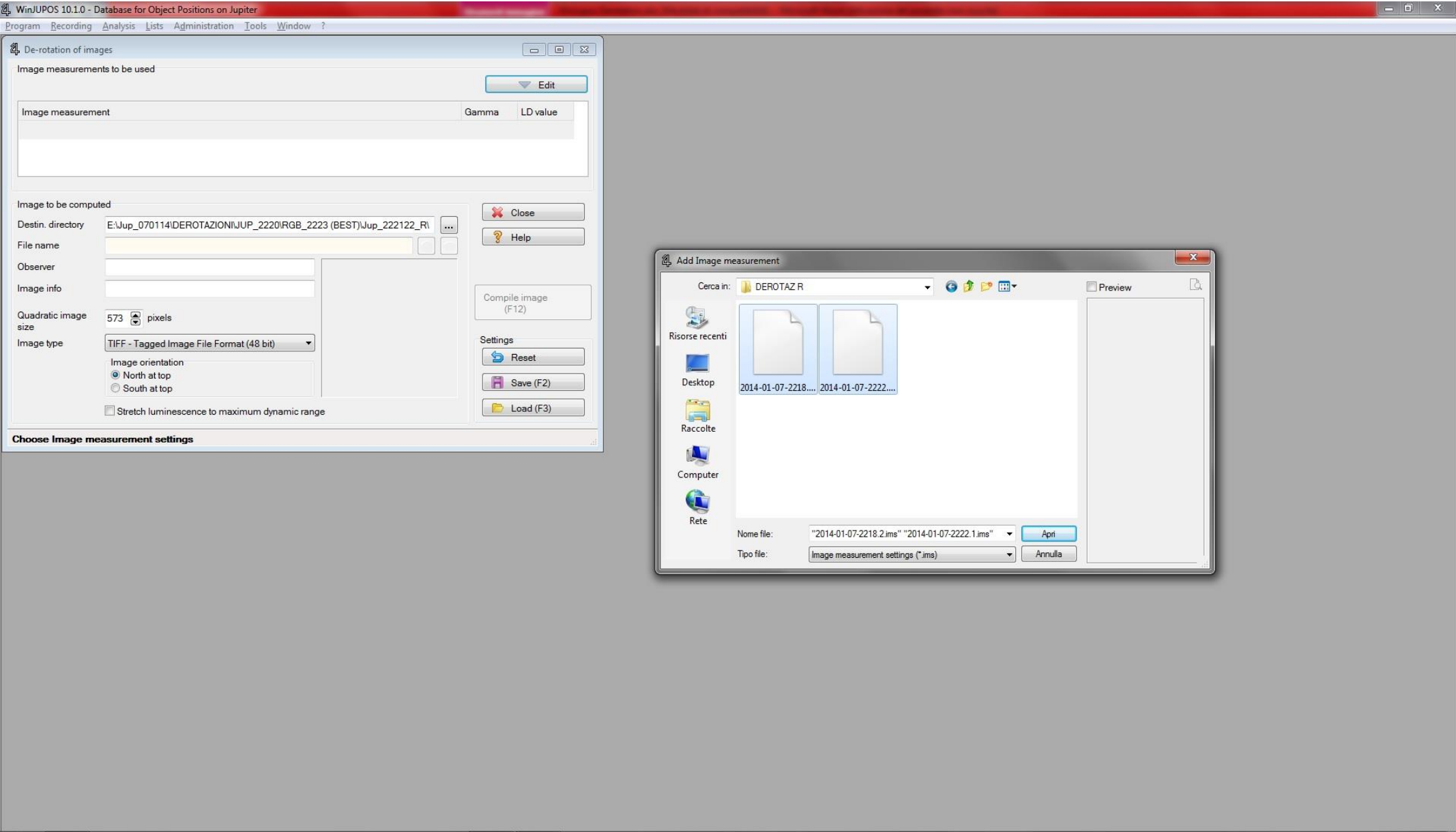
Go to “Tools” > “Derotation of images” window – (as in figure):



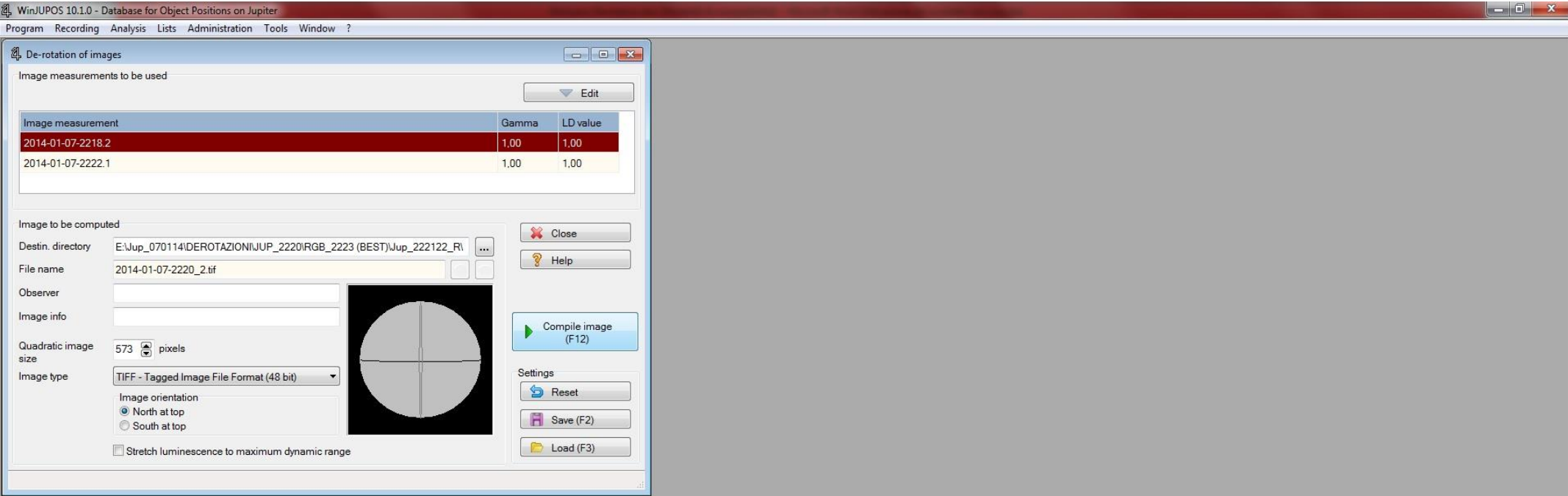
This will open the "De-rotation of images" window (see figure): Right click on "Edit" and consequently "Add" button to add all the images to be added (see the next Figure).



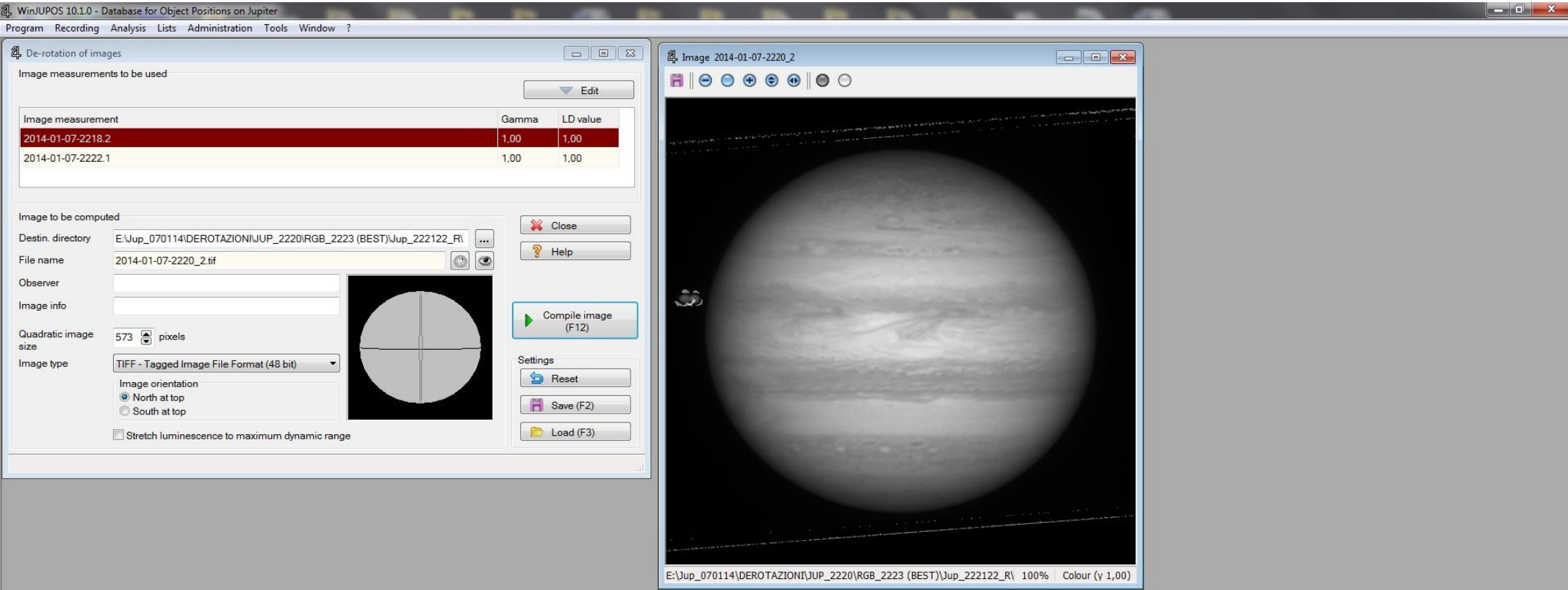
This will bring up the typical explorer window, and go to find the path through the folder where you saved the file measurement (those with .ims extension) of each channel R, G and B (see figure below).



At this point, you just have to add all the images (in the form of files .ims) at the same time by selecting them with the mouse, choose the characteristics of the file (in the "file type"), the size ("Quadratic image size") and Orientation ("N or S @ top "), and finally give way to the de-rotated compile simply clicking on the" Compile Images (F12) "as shown:



After a few seconds (depending on the power of your PC), it will form an additional window with the image resulting from the de-rotated compiled images (see figure): at this point you just have to click(if you do not need to zoom in or change the brightness and contrast the resulting image) on the typical symbol floppy disk "save image as" (the first icon from left in magenta color) to save the image as the result of the de-rotated compiled images of the channel in question (in this case R) by choosing a new special folder (you might call it de-rotated RGB) after from which, finally, will obtain additional files .ims for as we will see shortly.



Let us, finally, to the final part of this mini-guide: The de-rotated compile of the RGB channels in turn de-rotated and compiled themselves.

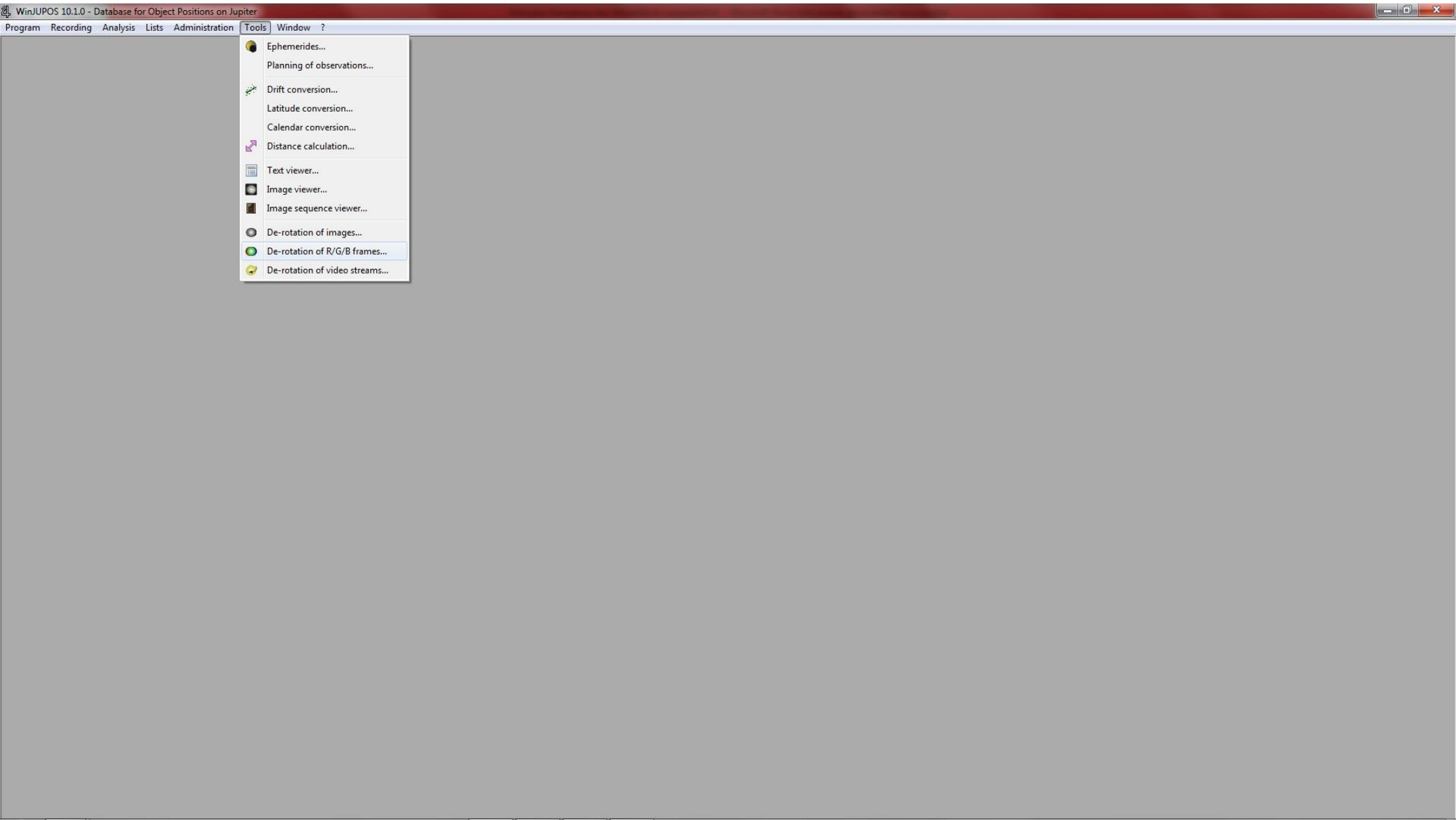
After placing the three de-rotated (R, G & B) for each channel images in a special shared folder (for ex. de-rotation RGB), proceed with the measurement of each image R, G and B "exactly" as we proceeded initially to the measurement of individual images R, G and B to be added and de-rotate.

So, following again the first part, we're going to open the three images (one at a time R, G and B), set the time parameters (geographical segments remain the same, in fact, I suggest you save them once set, clicking on the arrow is located under "Geogr. Latit." and entering a name, so you can reload them whenever they need) and proceed again with the " Automatic Detection" always being careful to orient formerly the North and the edge of P in the right direction.

As before, we will save so each measurement file images (always with the .ims extension) of the three R, G and B channels in a specific folder.

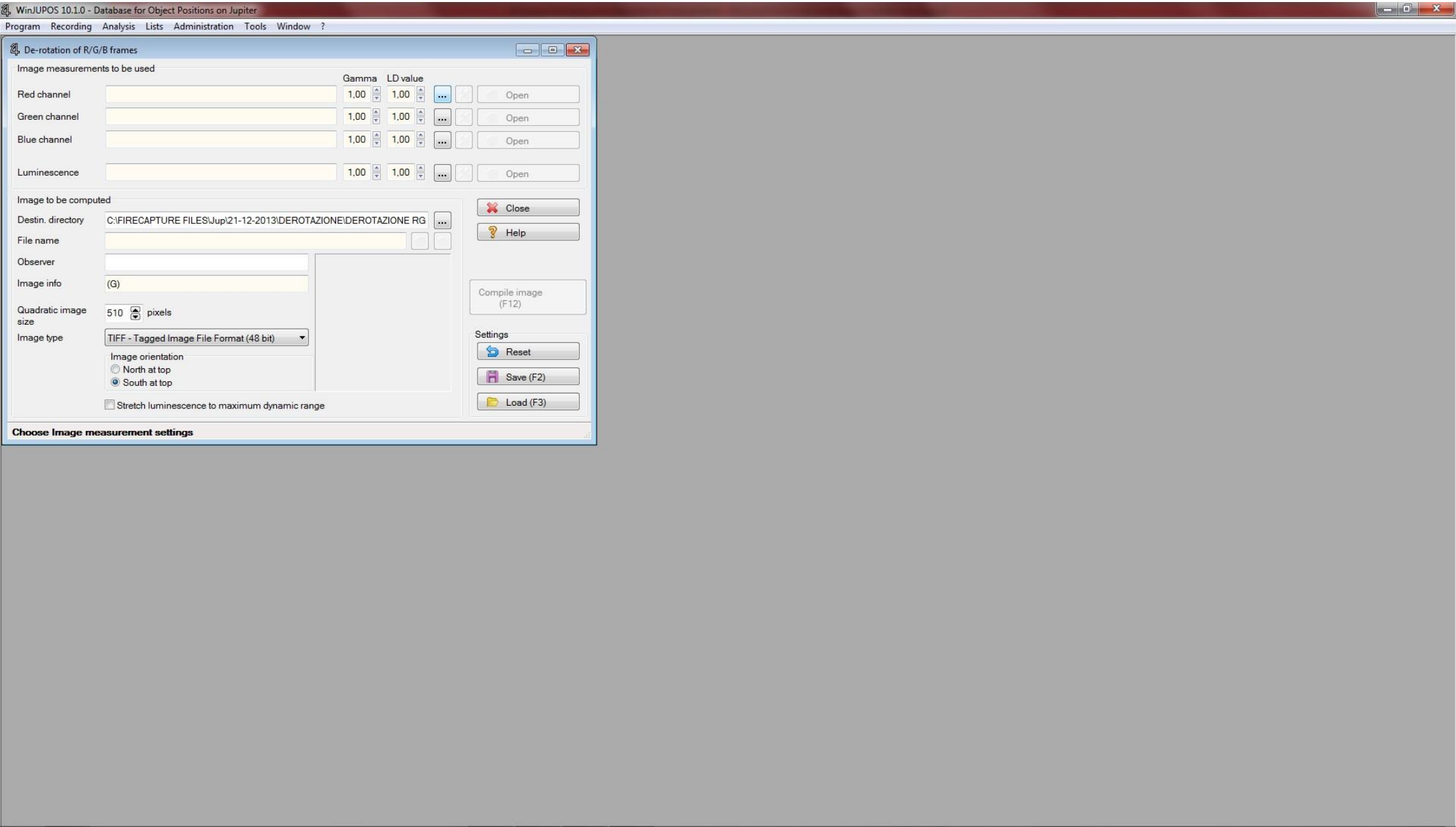
At this point, we proceed to de-rotated compile of the three individual channels (in turn previously de-rotated and compiled) R, G and B in the **RGB de-rotated final image.** 😊

So, go to "Tools" > "Derotation of RGB frames" (see figure):

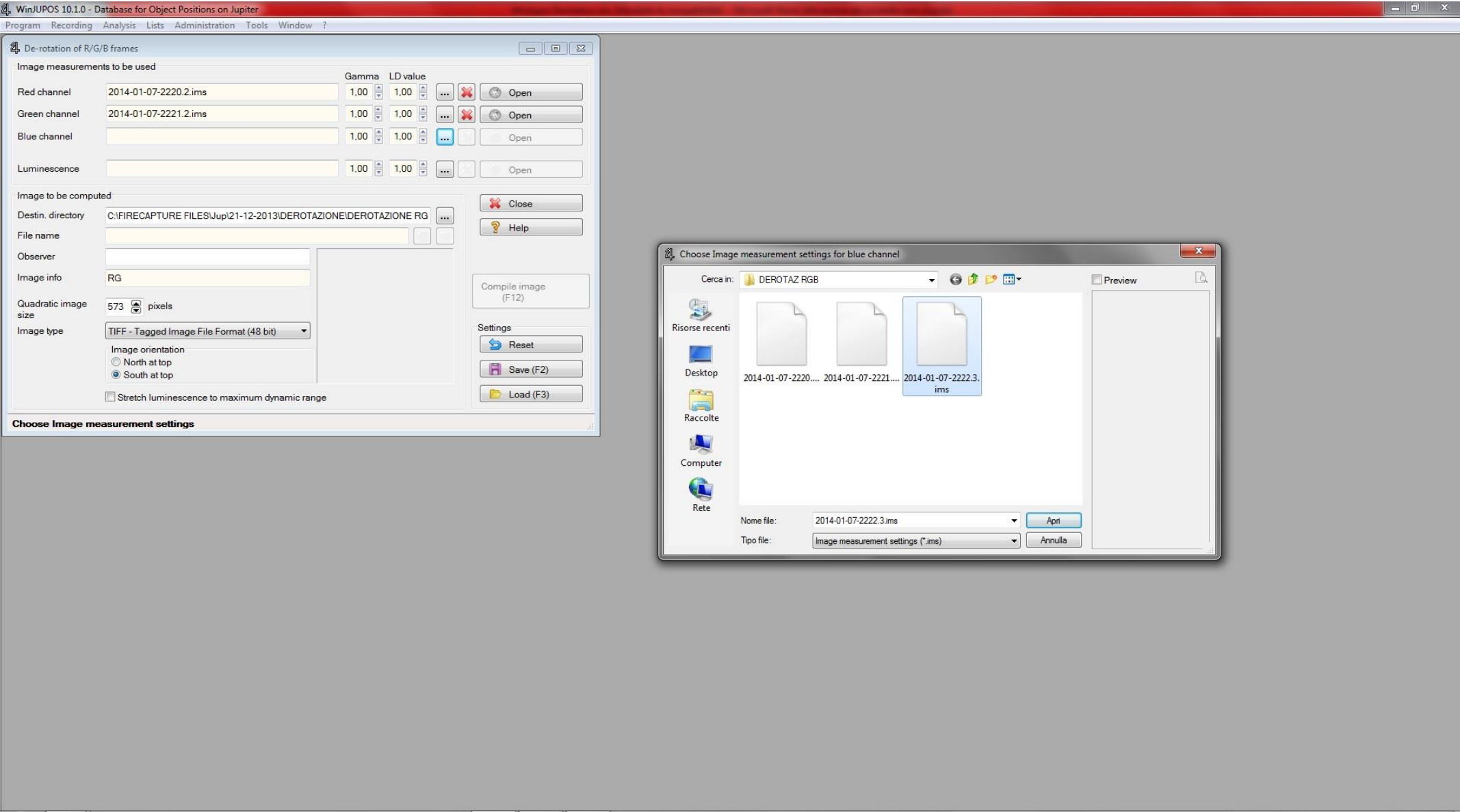




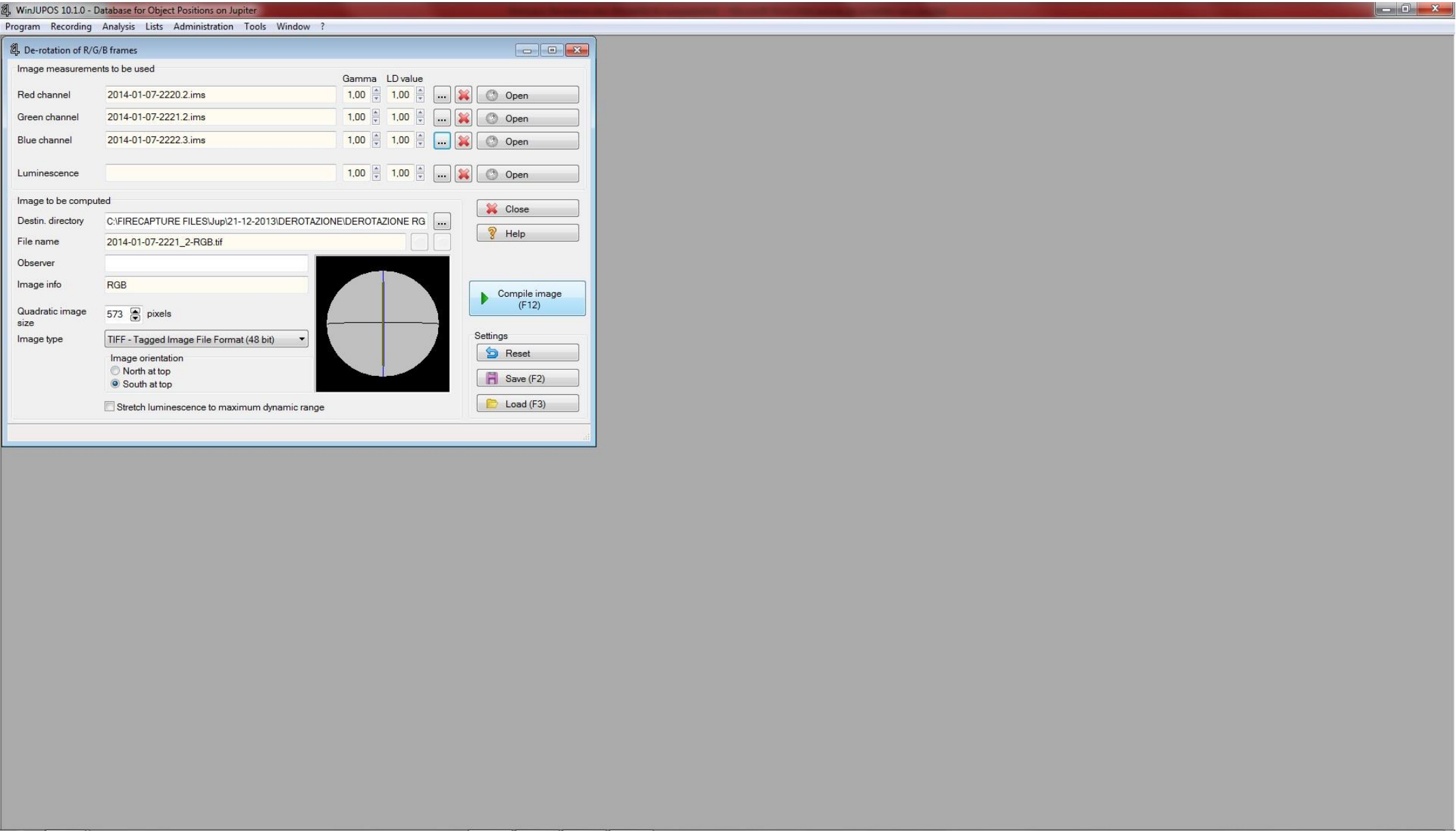
The following dialog compilation of RGB images will appear:



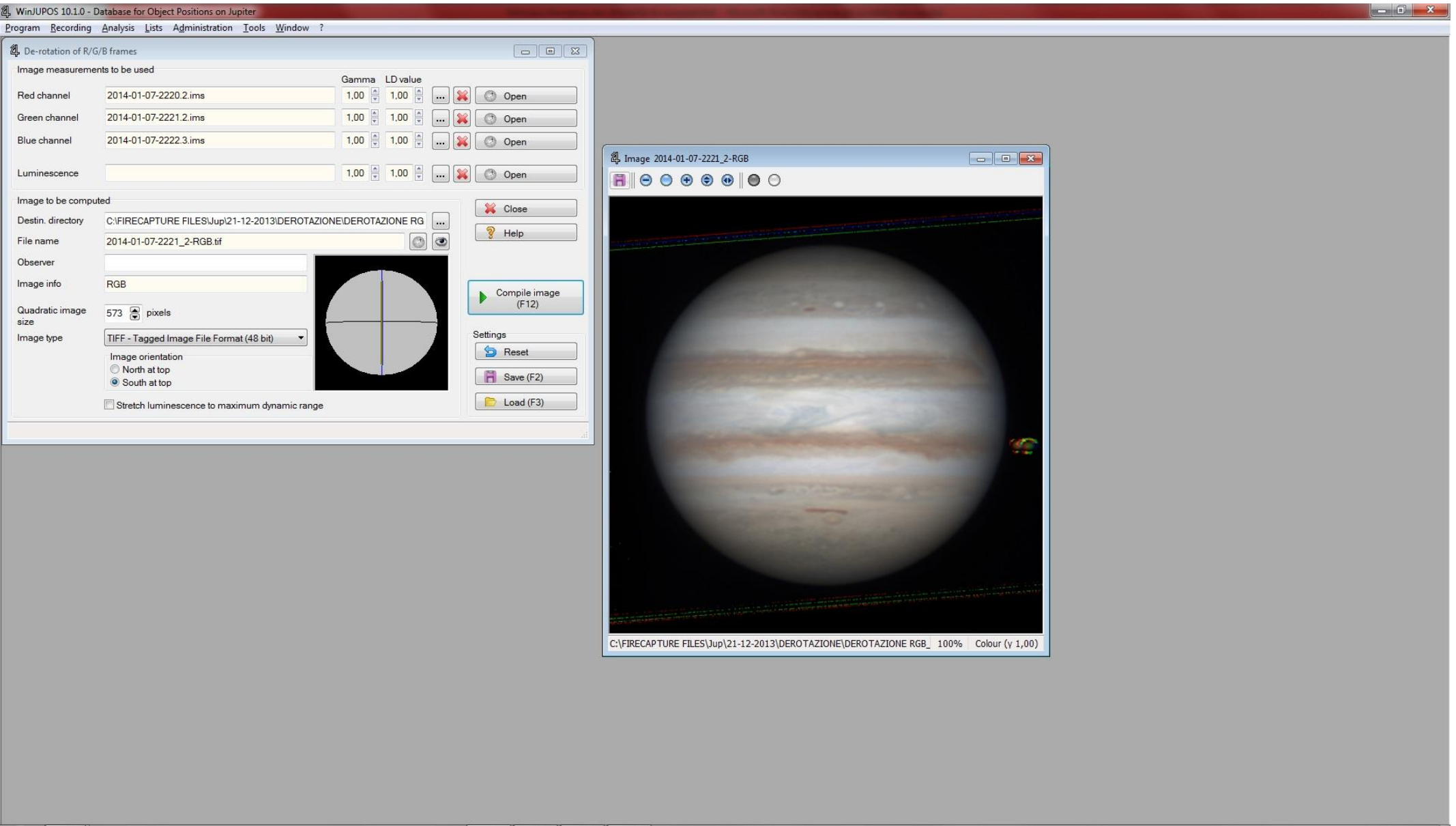
Click on each button with the symbol of three dots (those found to the right of Gamma and LD value buttons) to open the usual explorer window, choose to go to the folder in question (for ex. Derotation RGB) the three .ims files of measurement of the RGB channels just previously measured, and load them "one at a time" for the individual channels. Since files with names related to the time delay, if in the acquisition phase we started to shoot from the Red, Green and Blue in sequence, these files will have subsequent times, and this will help you understand what the Red is (chronologically the first) as the Green is (the second) and as the Blue is (the third), unless you have decided to change the name prior to the file being saved - (see figure).



Then, loaded files .ims, click on the button "Compile image (F12)" and wait just a few seconds.



Here, finally, is the fruit of sweaty work of de-rotation: the final RGB image, the result of the de-rotated sum of the three channels R, G and B, in turn, previously added and de-rotated for each channel. Click, as before, the symbol of the floppy disk "Save image as" to save the image in the desired format as well, ready to be finely drawn with your favorite software (I use Photoshop).



Doing the math in this specific case, the RGB image is the final result of the total stack of 2800 frames of which 500 x 2 in Red, 500 x 2 in Green and 400 x 2 in Blue channels, for a total time of 9 minutes of captured films, having proceeded during acquisition to capture AVI films of 90" of each channel which, in my opinion, is the best compromise between everything. However, we can vary the "recipe" for example acquiring films of 30 seconds x3 or x4 for each channel, it is important not to exceed the threshold of 15 minutes, experimentally, seems to be the limit beyond which the result begins to lose definition.

Obviously, in this alternative case, we add up and derotate for each channel 3 or 4 images as the result of the stacked of "X" stacked frames. In short, we have the opportunity to choose the best method experimentally that helps us to get a better result that, in our case, aiming us to highest possible resolution!

Well, at this point I just have to say goodbye, hoping that this mini-guide will be helpful at least to acquire an "initial method" by which you will have the opportunity, once assumed adequate familiarity, to develop additional methods and improvements in this amazing technique. For my part, I "discovered" this method really by only a few days, so I hope it was clear enough, I tried to marry the brevity (not to weigh and create discomfort) to the little detailed explanation, hoping to be able to not create doubts but rather certainties in this beautiful process.

Thanks, as always, for your attention and ..... good job !

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