Wavesharp 2 - Using the Background Enhancement Tool

Figure 14b: Set Peak to 3.50 and decrease brightness to 60% yields this result.

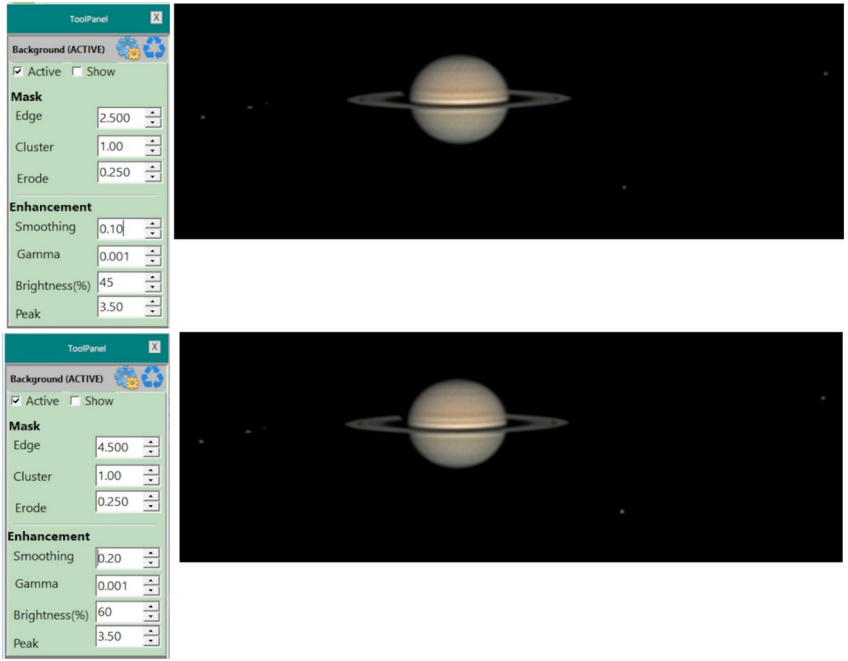

Figure 15: Side by side comparison of the two approaches described in this how-to.

How To:
Use The Animation Builder

Don Capone II

Wavesharp 2 - Using The Animation Builder

Introduction

Wavesharp 2.0 (WS2) contains an Animation Builder which offers the user an opportunity to assemble animations in both GIF and APNG formats. The Animation Builder is found in the bottom third of the Batch tab on the WS2 main control panel and relies critically on all three sections contained within the Batch tab.

Success in building an animation depends on understanding the three sections and avoiding pitfalls that can result in poor alignment, dropped or missing frames, and/or an incorrect ROI in the final animation. We will begin this user guide with the simplest (and usually most successful) procedure for creating your animation. I have highlighted common pitfalls, with the flag **CAUTION** in **BOLD text** in an effort to help the user avoid them.

Loading the Batch

In Figure 1a and 1b I have loaded 10 images into the batch all having the same capture ROI. WinJuPOS file naming convention was used to save the ser data and the images load into the batch in time-stamp order as a result. Loading the images is straight-forward. Use the Open menu command, highlight the images you want in the batch and then choose open. The first image in your batch will be displayed in the image window of the main panel. **CAUTION: For large image sizes it may take several seconds for the batch to load. You MUST wait for this action to be completed before proceeding. You know the batch is loaded when the Wavesharp main panel automatically opens the batch tab and the list of images is shown.**

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Once the batch is loaded you can proceed to process the image as desired. In Figure 1a the wavelet processing settings and the Zoom window used for these images is shown. In Figure 1b the histogram and FFT denoise windows are shown.

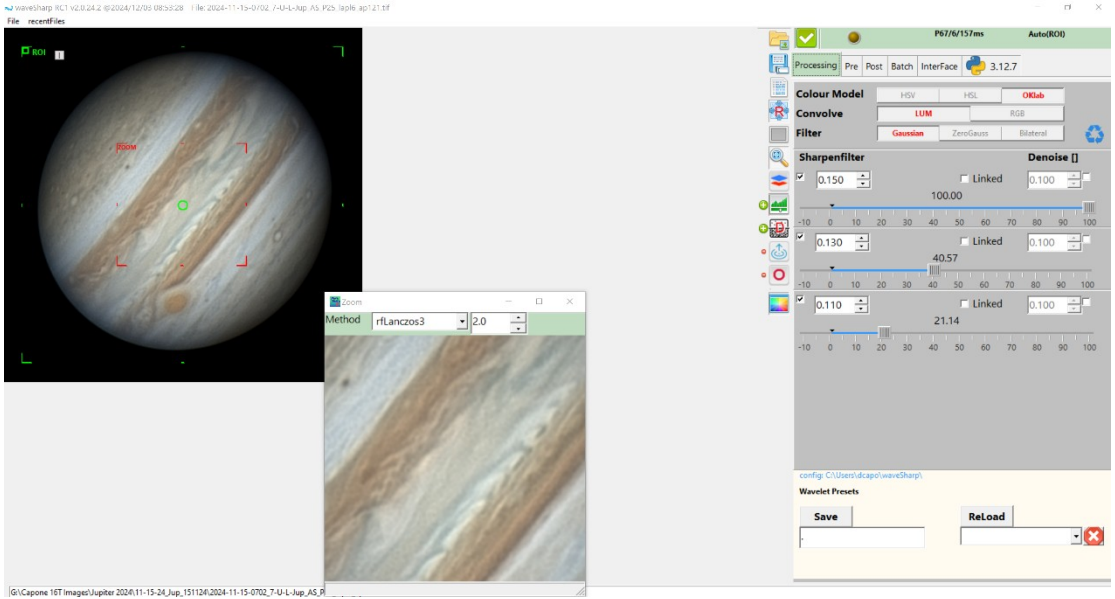

Figure 1a: The wavelets used to process this batch along with the Zoom window view are shown.

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These images were obtained using an alt/az mount and as you will see, it is in this situation where the animation tool really makes a difference. However, because these data were collected with an alt/az mount, Jupiter currently appears at the very steep angle to the horizontal.

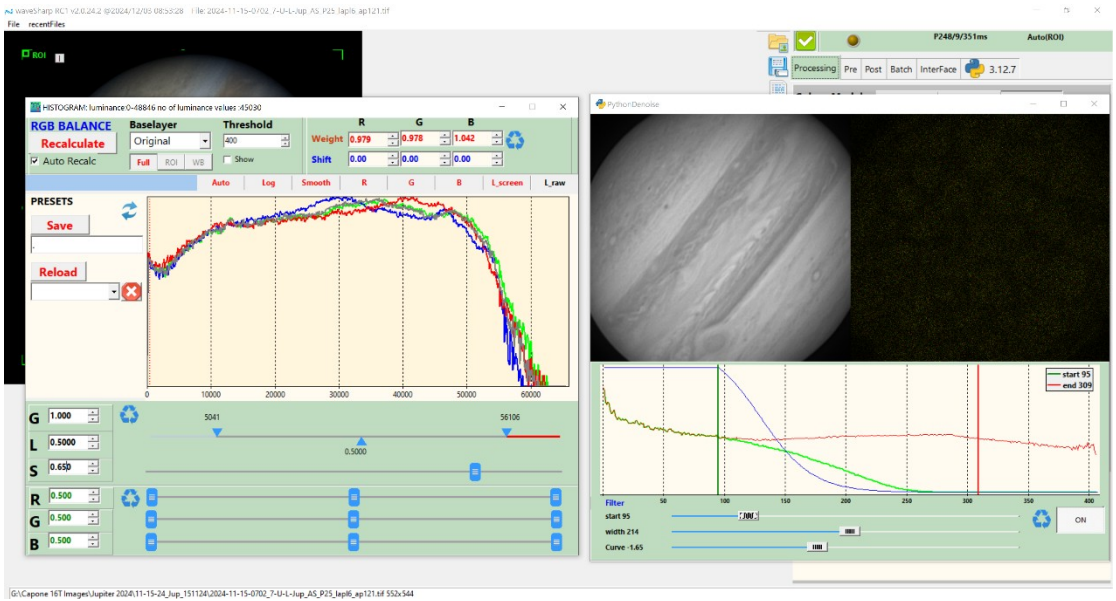

Figure 1b: The Histogram and FFT Denoise settings used for this batch are shown.

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I have chosen to decrease the angle of incidence of my Jupiter data using the Pre-Processing tab. I have input an angle of 40 degrees (+ is a CW rotation and – is a CCW rotation) in the Pre-processing tab. This action adjusts the first image of the batch (currently displayed) and marks the Pre-processing tab in BOLD red color. This is presented in Figure 2. **CAUTION: If you desire to use the Pre-Processing tab to change that angle of incidence you MUST do so BEFORE beginning the animation process**.

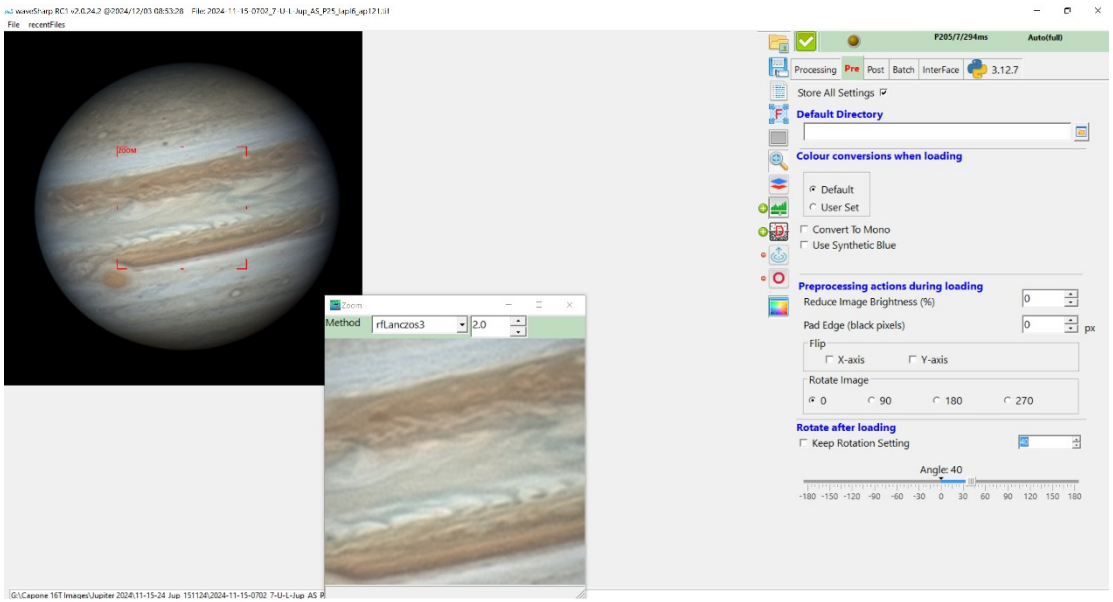

Figure 2: A rotation angle of 40 degrees is input in the Pre-processing tab.

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Building the Animation

There are three basic steps to building a successful animation. The first step has been completed when you properly load the batch of images to be animated as shown in the previous section. Building a successful animation is critically dependent on properly setting your reference image followed by choosing the formatting elements that will control the final appearance of the animation.

Let's first look at the full batch tab shown in Figure 3. The red arrow labeled 1 indicates the list of images currently loaded into the batch. Notice that the selected image is highlighted in blue. The red arrow labeled 2 indicates the section in which the reference image is defined. Finally the red arrow labeled 3 marks the section in which the formatting of the animation itself will be accomplished.

We will return to the batch tab later to see the situation when batches having differently sizes images are used.

The next step in the construction of a successful animation requires that a reference image be defined in the section marked 2. The number of iterations used to align the respective images to the reference image has a default setting of 1000 iterations. This is usually sufficient for simple animations that do not have either multiple image sizes or extend over long time durations from the start image to the end image in the batch. For these more complex cases the number of iterations can be increased to a higher value (up to 5000) which can improve the alignment of the images in the animation. For now, with the simple animation we will leave iterations at the default value of 1000.

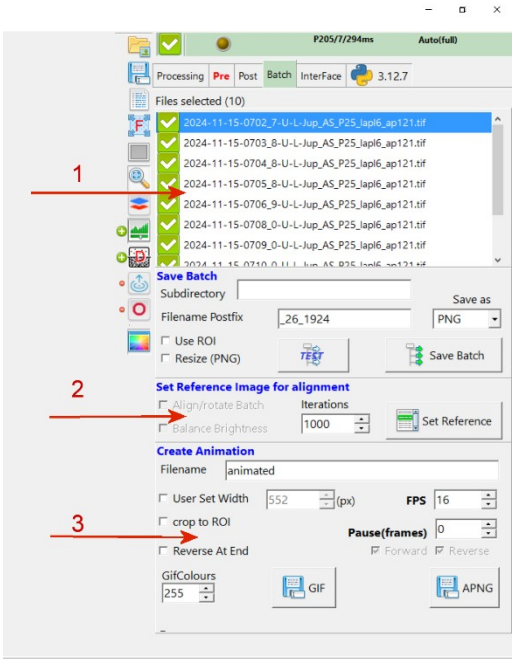

Figure 3: The batch tab.

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To define the reference image you 1) Select an image from the batch and 2) Push the Set Reference button. In Figure 4 the first image has now been selected as the reference image. Notice that the blue highlight has changed to a bright green highlight indicating that this image is now the reference image.

CAUTION: Once you have selected an image as the reference image no further changes can be made to the rotation or ROI for that image.

CAUTION: Once you have selected an image as the reference image you should NOT try and choose a new image in the batch to be the reference image.

Should you desire to change either of the above cautionary situations you should reload the images into the batch and make you desired changes to the ROI and rotation BEFORE selecting the new reference image. **CAUTION: These adjustments should be made on the image which will become the desired reference image.** This is easy and quick to do and provided you have selected "save all settings" in the pre-process window your newly loaded images will retain all the processing choices you have already input in the wavelets, denoise, histogram windows earlier.

At this point the user can now complete a simple GIF or APNG animation but simply selecting the GIF button or the APNG button in the lower section of the batch tab. The resulting animations are shown in the attached animation files: The GIF image is shown in the insert below.

animated_APNG_1_align_w552h544

animated_GIF_1_align__w552h544c255

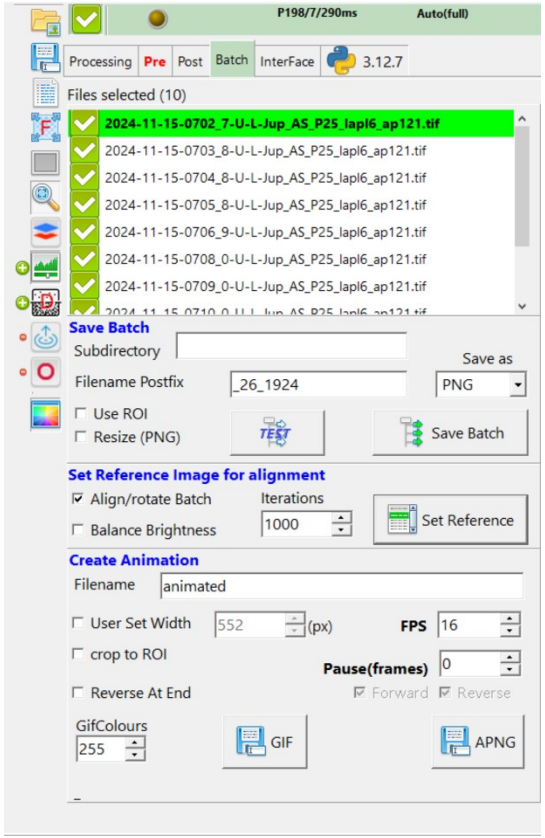

Figure 4. The first image in the batch is now shown to be the reference image.

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Adjusting the animation output format

Often the user will desire something a bit more complex, upscaled or downscaled, reversing the animation loop, and or inserting a multi-frame pause at the beginning or end of an animation sequence. To accomplish this we utilize the settings contained in the Create Animation section of the Batch tab. Using the existing batch without making any changes to the processing and reference frame it is easy for the user to implement these changes to the animation format.

Figure 5 demonstrates one such set of inputs. In this case, a User Set Width of 1000 is used to upscale the existing 552px frame to a width of 1000 px. The animation is set to reverse at the end. A frame rate of 16 fps is set along with the addition of a 5 frame pause at the end of the reverse sequence.

The animations resulting from these settings is shown in the attached animation files:

animated_APNG_2_align_w1000h986
animated_GIF_2_align__w1000h986c255

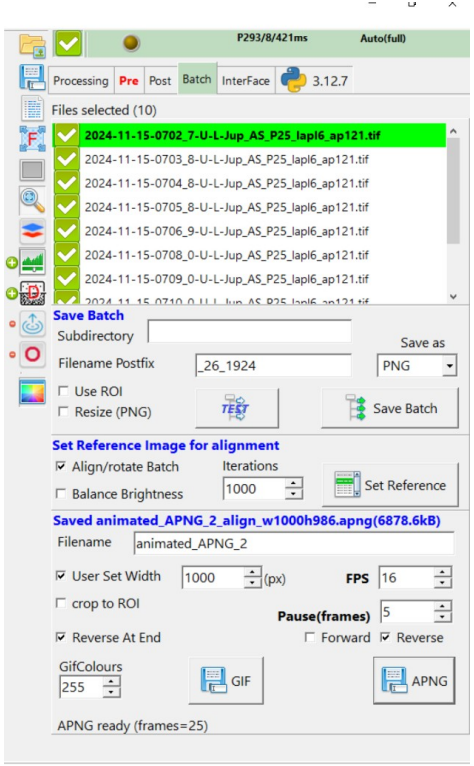

Figure 5: Adjusting the output format of an existing animation is straightforward.

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Another useful feature of the animation builder is the ability to crop the format to a specific ROI. Since I have already assigned a reference image in the above batch it is critically important to load a fresh batch of images as the reduced ROI MUST be set BEFORE assigning that image as the reference image.

In Figure 6, I have reloaded the same set of ten images into the batch. Once the images load the first image in selected and two inputs are made: 1) The desired rotation is set in the Pre-process tab. 2) The ROI is left in the R setting (R for reduced) and using the corner pulls, the ROI is moved over a specific portion of the image.

The resulting GIF and APNG animations achieved using the Crop to ROI inputs is shown in the attached files:

animated_APNG_3_align_w1000h644 and
animated_GIF_3_align__w1000h644c255

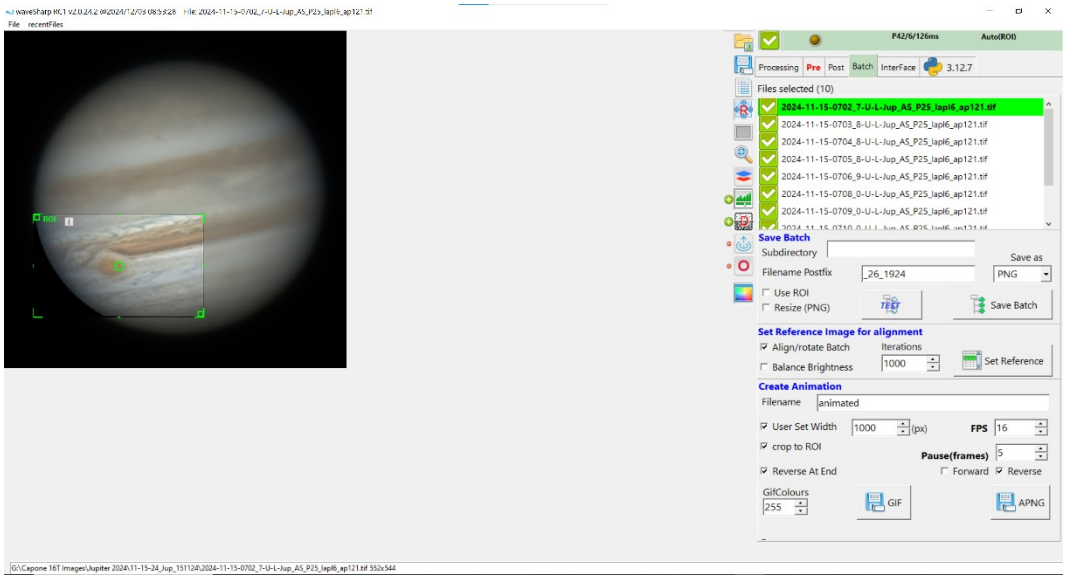

Figure 6: The rotation and ROI are set prior to defining the reference image.

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Building animations with different sized images in the batch

When building animations with multiple sizes of images most of the standard procedures described in the earlier sections still apply. There is now an additional requirement that must be adhered to in order to yield a successful result. When setting up the batch for animations with multiple sizes of images two cautions must be observed.

CAUTION: The LARGEST image in the batch MUST be the reference frame.

CAUTION: ROI and Rotation settings MUST be assigned to the image planned for to be the reference frame BEFORE defining that frame as the reference frame.

These two additional cautions are easy to manage but must be adhered to in order to achieve good results. Let's examine a batch of ten images from the same data set as above but obtained earlier in the capture series. Figure 7a shows this batch loaded in to WS2.

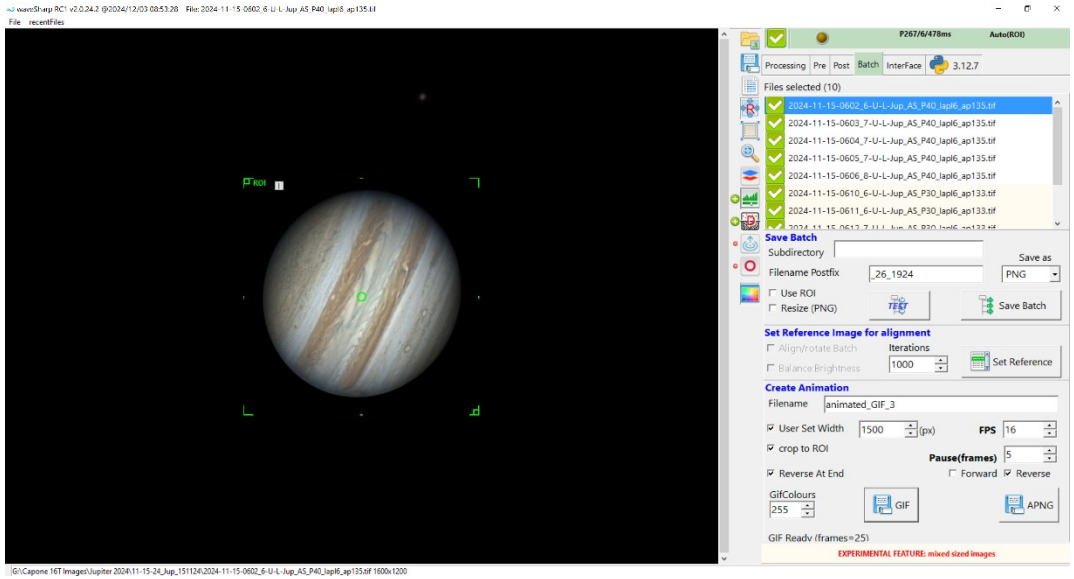

Figure 7a: A batch of 10 images loaded with 5 large images and 5 smaller images in the batch. This shows the larger image selected but not yet defined as the reference image.

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Notice how the ROI is not currently centered on the planet in the smaller image. This is not critical as you will NOT use the smaller image as your reference image.

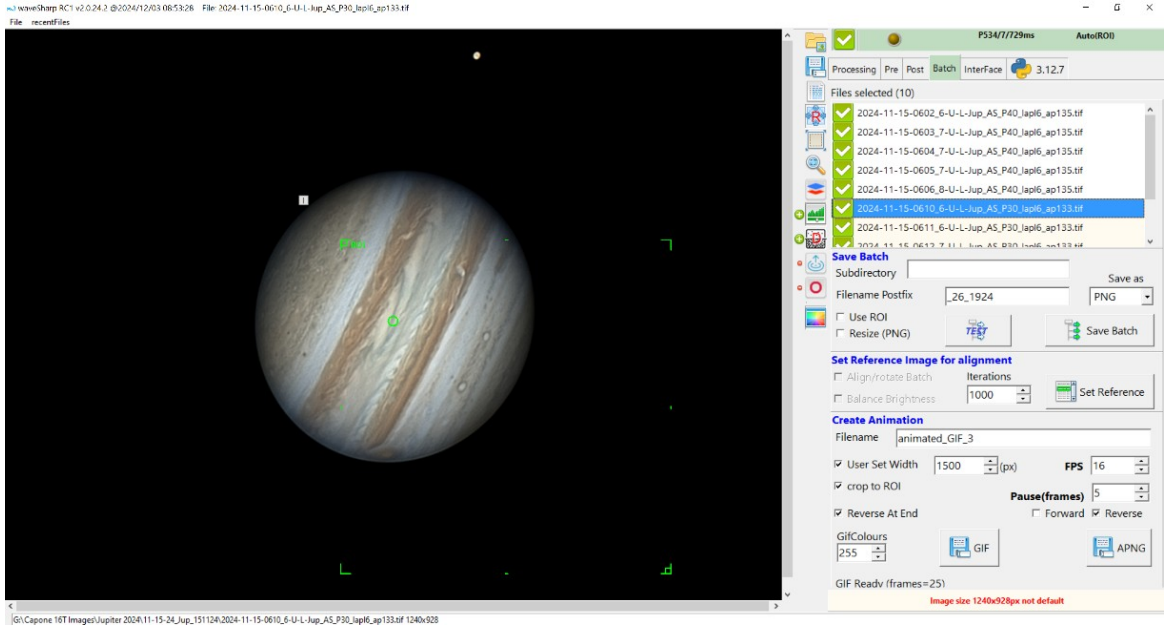

Figure 7b: One of the smaller images selected for viewing. Note: The background color difference between the larger (white background) and smaller (light yellow background).

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Returning to the first image in the batch (one of the largest images) with the image view fully expanded we can adjust the rotation using the Pre-Processing tab as well as set a reduced ROI to capture the portion of the image of interest to us. Once these two steps are completed the reference image can be defined with the Set Reference button. This is shown in Figure 8.

The animation files that results from these settings are attached:

animated_APNG_4_align_w1500h1100 and animated_GIF_4_align__w1500h1101c255

This how-to should provide users with a good starting point for achieving successful animations with Wavesharp 2.0. You will notice that when multiple image sizes are in use the animation builder shown a flag at the bottom which signifies the experimental nature of building animations with more than one size image. Heeding the caution note throughout the document should allow for success even in the case of more than one image size in your batch. IF your animation is not successful you can be quite sure you have ignored one or more of the caution notes.