

**Topic**

This technical note discusses the IM (Intensity Modulated) image option of the Ratio dialog and Automator task in Openlab 3.1.4 or higher. The use of the ratio operation itself is not covered and users should consult the Openlab User Guide.

**Discussion**

IM is part of the Ratio module, and requires Openlab 3.1.4 or higher.

IM allows the creation of a display image in addition to the ratio image.

The IM image uses pseudocolor and intensity to display a ratio image. Color is used to represent relative ratio, intensity represents the intensity of one of the source images. This technique helps reflect spatial information since the intensity of the original images is reflected in the resultant image.

This is useful because a limitation of ratio images is that differences in intensity between areas of the image can be lost by ratioing. Eg.  $400/200 = 2$  and  $4/2 = 2$ . These areas were very different in the original images but in the ratio image they now have the same value. Scaling by the intensity in one of the original images will reflect that difference again.

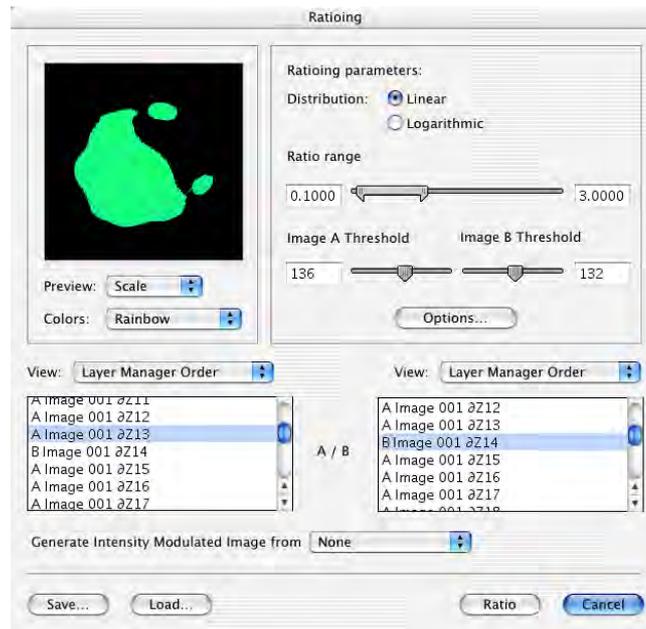
To produce the IM image the intensity of each pixel of the ratio image is scaled based on the range of intensities in the source images. The source image used for this is called the modulator image. The modulator image can be one of the source images, the brightest of the source images or the average of the source images.

The range of colors in the IM image is determined by the look up table applied to the ratio image.

The range of intensities in the IM image is determined by the range of intensities in the modulator image.

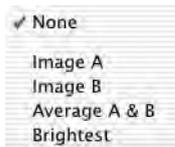
The IM image is a millions of colors image. It is for visualization, measurements should be made on the ratio image.

## The Ratio dialog



Choose to generate an IM image in addition to the Ratio image by selecting the modulator image from the pop up.

None will mean no IM image is generated. The modulator image options are:



Only the Ratio image is previewed in the Ratio dialog.

Click Ratio to generate both the Ratio image and the IM image.

## The Ratio Automator task

The setup dialog for the ratio task also allows an IM image to be generated.



IM images are named: *(name of ratio image) IM name of modulator image.*