Process Description:

"Dark Current" is background noise in the camera used for imaging. This noise is generally a few hundred counts, and is not uniform throughout the image, sometimes varying by > 10% within the imaging area of a single camera, and can vary even more between cameras. This noise is measured by taking several "dark-current images" images where there is no light incident on the camera CCD. These images are then averaged together, and used to correct for the inhomogeneity of the dark-current by subtracting the dark-current value from each pixel. If a single camera is being used for all image acquisition, a single set of dark-current images can be used to correct all channels. If different cameras are used, it is best to collect and use dark images for each camera. The final, averaged (and possibly filtered) correction images, in addition to the corrected images, can be seen by clicking the "Result" button.

Parameter Descriptions:

Input Channels:

This allows you to select which channels you want to perform dark-current correction on. This should be applied to all channels that are going to be used for ratioing or bleedthrough correction. Select the channels by clicking on them in the "Available Input Channels" box and then clicking "Select->" to move them to the "Selected Channels" box. You can unselect a channel by clicking the "Delete" button

Dark-Current Image Channels:

This box allows you to specify a directory containing the dark-current images corresponding to each channel to be corrected. You must specify a directory for each channel to be dark-current corrected, but the same directory may be specified multiple times. The directories specified should contain one or more "dark-current images". It is recommended to take 5 or more, as these will be averaged together to improve the quality of the correction. Using only a single correction image can introduce error into the final ratio images.

3x3 Median Filter:

If this box is checked, a median filter will be applied to the dark-current images prior to their use as a correction. This is useful because it minimizes the contribution of noise in the dark images, and removes "hot pixels" pixels which have a much higher than normal background value (several hundred counts).

Gaussian Filter:

If checked, the dark-current images will also be filtered (smoothed) using a Gaussian filter whose sigma (in pixels) is specified by the value in the "Sigma" box. Larger sigmas will give smoother images, but if the sigma is too large, spatial information will be lost. A sigma of 1 is a good starting point. This can be used to further reduce noise in the dark-current images and is especially important if only 1 or a few dark-current image(s) are taken.