



CCD IMAGING

Bad Image Examples





CCD Bad Image Examples

Overview

What counts for a “bad image” is a question often received.

This lesson will provide examples of some bad images, describe what happened, and also point out some cases where these images may still be useful.



CCD Bad Image Examples

Vignetting

Illumination is not always constant across the entire CCD chip. In this case, applying a Flat Field subtraction can balance the light collection and provide a better image.



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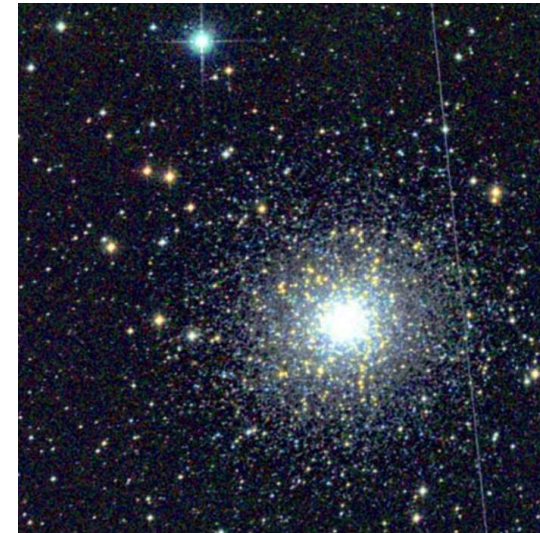


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Satellites, Aircraft, and Other Flying Objects

Sometimes, an exposure will capture flying objects, Earth bound or space bound. Since the CCD lens is open for an extended period of time, this light will be captured on a still background as a streak.

This can be ok in your image, provided it does not overlap a Target Star or a Comparison Star. If it does, those images should be discarded from the image set.



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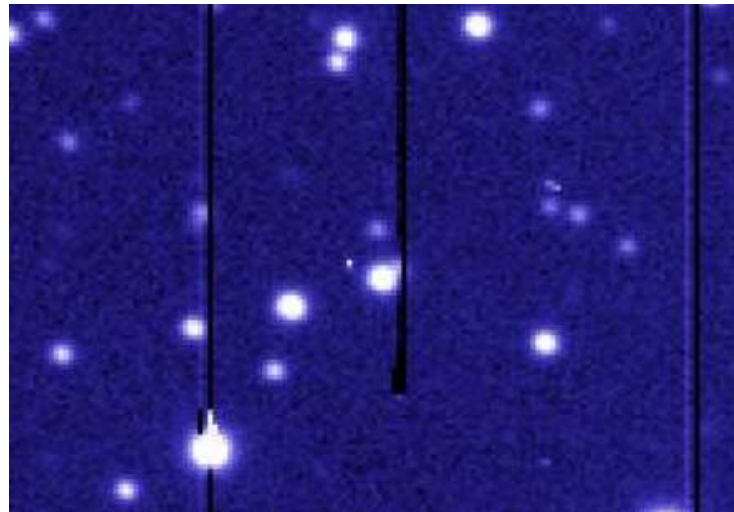


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Dead Columns

After a while, columns of pixels can become “dead”. Where the pixels have lost effectiveness in capturing photons, you will see streaks.

There is nothing you can do about this to recapture the data. Ensure that your Target or Comp stars are not located in one of these regions. Additionally, ensure that apertures, used in Aperture Photometry, are not overlapping these regions either.



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Hot Pixels

Sometimes a pixel will become “hot” which means it will be turned on all the time. This will result in single pixel white points that look like stars. Performing Dark subtraction can remove these bad pixels and restore your image.



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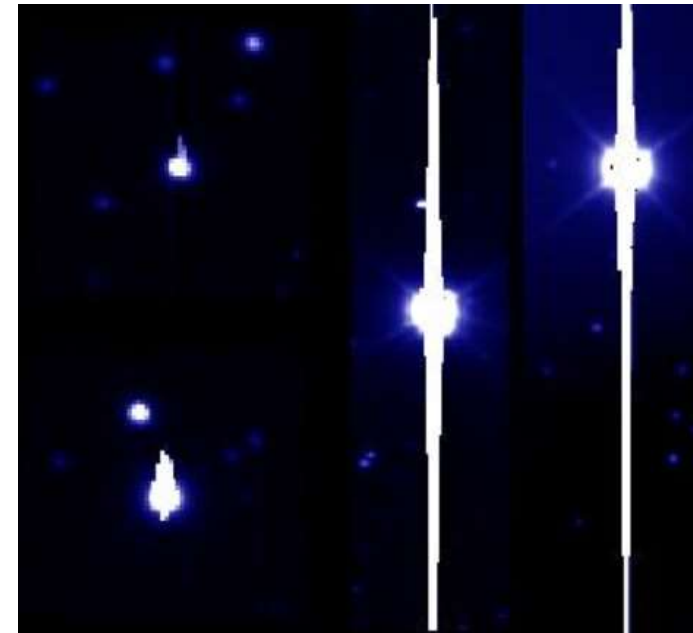
Blooming

When a pixel site becomes “full” from too many photons hitting that site, they will start to overflow into adjacent sites. This leads to streaking, also known as blooming.

Blooming in an image is ok, provided these streaks do not impact your Target or Comp stars.

In fact, you may need to increase exposure times to capture faint stars, that will result in Blooming for the bright stars in the field of view.

Again, this is ok, if it does not impact your desired stars.



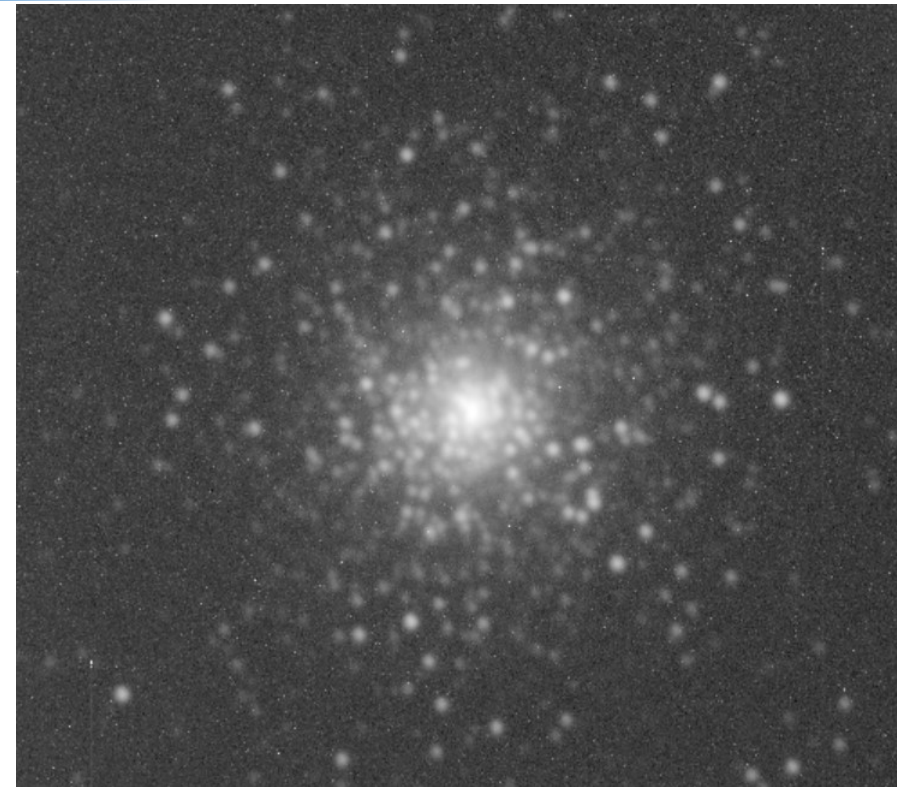


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Blurry Images

Blurry images are a result of being out of focus. This is OK for photometry, and in some cases is recommended.

For pretty pictures, blurry images should be discarded with the only correction being to retake the image in focus.





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Bad or Loss of Tracking

If the telescope mount loses tracking or performs poorly at tracking, the result can be streaks of stars in your images.

This is not recoverable and the mount tracking issues should be addressed.





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Summary

In this lesson, we have outlined some examples of bad CCD images.

Previous lessons and classes have discuss poor images, and this provides some examples.

As you see, in some cases, such as blurry images, the data may be good for one kind of project, but not others. This needs to be assessed against what your desired project is.

All images should be assessed for quality before performing science on them.

Finally, not all images collected by the same telescope, camera, and filter combination on the same night at the same time, will be good. Imperfections can happen and thus should be examined prior to processing for the purpose of science.



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Questions?