

Re: Lens shading/vignetting question

Source: <http://sci.tech-archive.net/Archive/sci.optics/2008-04/msg00180.html>

- *From:* ImageAnalyst <imageanalyst@xxxxxxxxxxxxxxxx>
 - *Date:* Thu, 24 Apr 2008 16:39:15 -0700 (PDT)
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On Apr 18, 1:39 am, "anorton" <anor...@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx> wrote:

"ImageAnalyst" <imageanal...@xxxxxxxxxxxxxxxx> wrote in message

news:dd2ae235-9b81-4570-9166-5a17ba8360c9@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

We put a lens on a big CCD chip and noticed a huge (2-to-1) drop off in intensity near the edges, like dark vertical bands near the right and left edges – not so much on the top and bottom edges. Now if I remember my terminology correctly "vignetting" happens when the optical stop actually occludes part of the optical path, which I don't think was the case here (it happened even with iris wide open). (By the way, there was no shading at all with the lens removed so it is due to the lens.) The manufacturer calls it "lens shading" rather than "vignetting" which I agree with. Would that be the more accurate terminology? What causes this shading? Is it that there is more glass to go through when the ray of light is traveling towards the edge of the image and so it gets attenuated more, and so it's darker there? Is that the right explanation, or is it something else? Someone said try bigger 45 mm machine vision lenses rather than standard lenses meant for 35 mm sensors to reduce the lens shading. Anyone agree with that?

Vignetting does not occur when the aperture stop occludes the optical path.. The stop will ALWAYS occlude the path (otherwise it ain't an aperture stop). Vignetting occurs when some other edge partially or fully blocks the path for some parts of the field but not others. You will actually see the most vignetting (if there is any in your image) when the iris is open, and the least when it is closed.

Any lens designed for a certain size format will likely show significant vignetting when used with a larger format. Aside from that, it will also

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likely have really large aberrations outside the designed format.

Usually the vignetting appears circular since the internal components are usually circular. The vertical bands on the sides and the term "lens shading" used by the manufacturer make me think this lens has a rectangular sun shade on the front of it that is doing much of the vignetting.

Adam Norton

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Thanks to all 3 who replied. The dark bands on the side appear somewhat worse than they really are because the image has a 4:3 aspect ratio so the image extends farther out to the sides than vertically. The attenuation in the vertical direction at the same distance from the center I think was roughly the same. I think we'll take the advice and try a lens made for a larger format. We have plenty of light so any additional attenuation due to the lens having more glass would not be a problem.

Thanks,
ImageAnalyst