

Re: CMOS vs. CCD -- Link to Article

Source: <http://sci.tech--archive.net/Archive/sci.astro.amateur/2005-12/msg00349.html>

- *From:* Chris L Peterson <clp@xxxxxxxxxxxxxxxxxxxxx>
 - *Date:* Sat, 03 Dec 2005 17:08:50 GMT
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On Sat, 03 Dec 2005 16:42:06 GMT, "Roger Hamlett"
<rogerspamignored@xxxxxxxxxxxxxxxxxxxxx> wrote:

>Though this is somewhat 'misleading', since the reason the Canon cameras
>give this performance is partially the internal processing they perform.
>The chips contain a factory 'noise map', effectively a bias frame, and
>data on the rate the noise grows with time for each pixel, and if asked
>not to perform an 'auto-dark' (some models if asked to do long exposures
>will perform an automatic dark subtraction), will instead synthesise a
>'dark' from these numbers, and subtract it. The result is that the dynamic
>range of the image decreases with longer exposures, and this can be
>measured and verified.

There is no noise map. Such a thing is impossible. There is a dark
frame, which is scaled for exposure time and subtracted from the image
to remove the dark current signal. But the dark current noise remains--
it cannot be removed by subtraction, only by filtering techniques that
also destroy image information.

The way that you measure the dark current with a Canon camera is to take
a long exposure, measure the noise, and square that value. This yields
the actual dark current signal for that exposure (which can't be
directly measured because of being subtracted by the DIGIC processor).
This is only an approximation, however, since it is likely that there is
some internal filtering going on to reduce the noise.

The Canon sensors have very low readout noise, which is why they perform
so well for normal terrestrial imaging. Compared to most uncooled
sensors, they also have low dark current, although this is still quite
high compared with a cooled CCD.

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 - ◇ *From:* David Nakamoto
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