SBIG
ASTRONOMICAL
INSTRUMENTS

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Application Note

Vertical Streaks in Millisecond Exposures in Interline CCDs

November 4, 2004

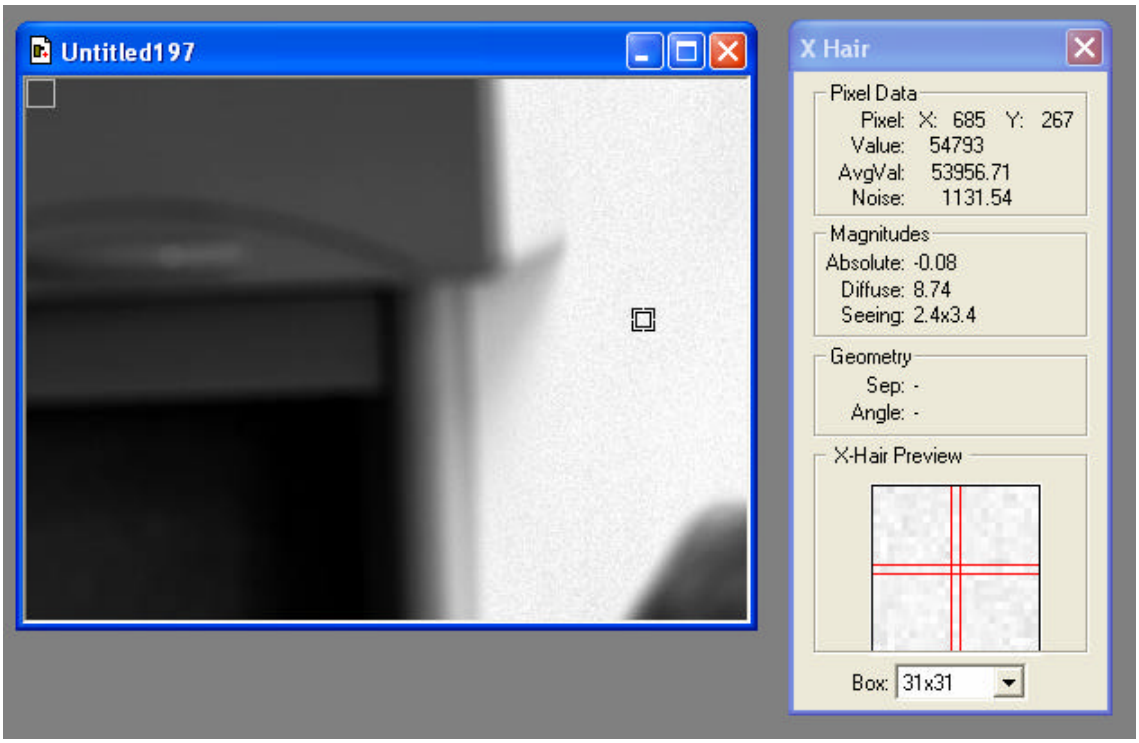
Cameras based on interline CCDs like the ST-2000, STL-11000 and STL-4020 show a vertical streak artifact in millisecond type exposures of bright objects as demonstrated in the image below:

0.001 second exposure in ST-2000 in Low Res mode

This artifact is a side effect of optimizing the antiblooming voltage on the interline CCDs (Vsub) for long integration astronomical imaging. We have set the Vsub to a level that ensures a high full well capacity for long exposures but doing so causes this blooming in short exposures of very bright scenes.

In the SBIG cameras the Vsub voltage is controlled by a potentiometer on the digital board in the back of the camera. This potentiometer, VR1 is set at the factory for a Vsub of 7.2 volts with the wiper of VR1 set fully clockwise.

Adjusting VR1 by ¼ turn (90 degrees) counter-clockwise will raise Vsub to 10.5 volts and eliminate the vertical streaking. Unfortunately the 10.5 volt setting causes long integration images to saturate around 50,000 ADU rather than the desired 65,535 ADU as can be seen in the image below.



Our recommendation is you set the Vsub at 10.5 volts for millisecond exposures of bright scenes and then return Vsub to 7.2 volts for astronomical uses.

Adjusting Vsub

VR1 can be adjusted using a small screwdriver inserted through the slots in the back of the camera. You'll find VR1 between the Fan and the large IC to the right of center in the camera. We recommend you make this adjustment with the camera powered off so as to avoid the possibility of shorting something out with the metal blade of the screwdriver.