

# Ambient Testing of UVIS Filter Ghosts

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Thomas M. Brown & Olivia Lupie  
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## ABSTRACT

*As part of the ambient testing done in advance of thermal-vac testing, we have obtained additional observations of the ghosts in the WFC3 UVIS channel. These new observations were restricted to a subset of filters that represent the range of behavior observed in earlier testing, in order to verify this behavior and look for any changes in this behavior. Our analysis of the F606W, F280N, and F225W images shows the same ghosting observed previously, and documented in ISR WFC3 2004-004.*

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The UVIS channel on the WFC3 exhibits significant ghosts in a subset of its filters. These ghosts were found in the “mini-calibration” testing performed in December 2003 and January 2004, and are described fully in WFC3 ISR 2004-004. On 29 June 2004, we obtained Xenon lamp point source images through the F606W, F280N, and F225W filters, as part of the ambient testing of WFC3. These filters give a fair representation of the ghosting behavior seen previously. These new observations were intended to verify the ghosting behavior and to check that the ghosting properties of these filters has not changed since January. The data are associated with test program UV25S01.

As written, the current test obtained a pair of unsaturated and saturated images in these 3 filters at 8 field points, specified in Table 1 (relative to field center). Because the ghosts appeared unchanged from the January tests, and due to time constraints, the last two positions in the test were cancelled.

Looking at the images, the ghosts appear to be the same, both qualitatively and quantitatively, as seen in the January tests (compare Figure 1 to WFC3 ISR 2004-04). The F225W shows a series of donut ghosts with a total strength of approximately 15%. The F280N shows donut ghosts in some positions (total strength of 5-10%), while in other

positions the dominant feature is strong scattered light around the source. The F606W shows both faint donut ghosts from the window (3 ghosts at 0.1% each) and a handful of point-like ghosts from the filter (at strengths approaching 0.1% each) with a total ghost strength of approximately 0.6%.

Field Position (pixels)	Unsaturated image	Saturated Image
-1600,-1600	800x800	800x800
-1600,+1600	800x800	800x800
+1600,-1600	800x800	800x800
+1600,+1600	800x800	800x800
0,+200	200x200	full frame
0,-200	200x200	full frame
0,+1000	800x800	800x800
0,-1000	800x800	800x800

**Figure 1:** On the following page, we show the ghosts in the F225W (top panels), F280N (middle panels), and F606W (bottom panels) filters. The left-hand panels show the ghosts when the source is placed in the lower left-hand quadrant, while the right-hand panels show the ghosts when the source is placed in the upper right-hand quadrant. The F225W images show large donut ghosts from the filter substrate interfaces. The F280N images show large donut ghosts from the filter and significant scattered light (possibly from degradation of the filter substrates). The F606W images show large donut ghosts from the windows and small point-like ghosts from multiple reflections off the substrate surfaces. This behavior was seen previously in the mini-calibration of Dec 2003 and January 2004.

