

Correction to "Small-comet 'atmospheric holes' are instrument noise" by F. S. Mozer, J. P. McFadden, I. Sircar, and J. Vernetti

Table 2 of Mozer et al. (1998) is a specific example of the fact that data processing to remove bright pixels (caused by penetrating radiation) from VIS images, using the IDL program provided by Frank and Sigwarth, produces more than 75% of the "atmospheric holes" in the one day of raw VIS data available to the authors. The numbers in this Table 2 are incorrectly described by Mozer et al. (1998) as being raw pixel counts from a VIS image, before and after removal of the bright pixels. They are, instead, a pseudo-logarithmic function of this raw data. This function was inserted into the data stream of the Iowa IDL programs to obtain proper color balance in Figs. 3 and 4 of the paper, and the function was inadvertently included in the analyses associated with Table 2. None of the conclusions reached from Table 2 are modified by the correction of this oversight.

Actual data from the VIS instrument, before and after removal of bright pixels by the Iowa IDL code, are displayed in the nine by nine pixel arrays of the corrected table, Table 2c. These arrays cover the same time and location as the data of Table 2 of Mozer et al. (1998), which is centered at $X = 23$, $Y = 72$, in image 1257 taken at 2239:29 UT on June 1, 1997. As was the case for the original Table 2, the center pixel in these arrays is unchanged by removal of the bright pixels in the image, but five pixels along the bottom border and 19 pixels within the border of the array are replaced by a constant value. The Iowa method for replacement of bright pixels is described in Mozer et al. (1998). This replacement lowers the standard deviation of the 32 numbers around the border in Table 2c from 54.5 to 10.2, such that the constant central value of 77 went from being 0.6 standard deviations below the mean of the 32 points before bright pixel removal to 2.1 standard deviations below the mean after bright pixel removal. As in the original paper, there are five contiguous pixels that are less than two standard deviations below the mean before bright pixel removal and more than two standard deviations below the mean after bright pixel removal:

Location of center pixel		Standard deviations below the mean	
X	Y	Before bright pixel removal	After bright pixel removal
23	72	0.6	2.1
22	72	0.6	2.3
24	72	0.6	2.5
24	73	1.6	2.7
25	73	1.2	2.0

Thus, removal of bright pixels created five contiguous dark pixels where no dark pixels existed prior to bright pixel removal. Because the nominal Iowa definition of an atmospheric hole is the presence of five or more contiguous pixels with counts that are more than two standard deviations below the mean of the points around the border of the nine by nine array centered at the pixel of interest, the processing to remove bright pixels caused a new "atmospheric hole" to be created in the vicinity of the data of Table 2c.

We thank L. A. Frank for calling our attention to this minor error.

Table 2c. Counts in a nine by nine array of pixels before and after removing penetrating radiation

Before Removal								
121	93	93	89	101	91	79	93	107
97	91	83	105	121	105	107	107	119
109	109	87	162	230	119	111	107	103
93	111	121	101	87	99	103	101	89
89	97	105	77	77	75	91	97	97
75	79	87	99	87	77	83	101	105
85	89	101	97	81	81	99	97	105
105	83	93	190	134	103	97	101	109
113	113	138	404	115	91	93	101	87
After Removal								
121	93	93	89	101	91	79	93	107
97	91	97	97	97	97	107	107	119
109	109	93	97	97	97	111	107	103
93	111	93	93	97	99	103	101	89
89	97	105	77	77	75	91	97	97
75	79	87	99	87	77	83	101	105
85	89	97	97	99	99	99	97	105
105	97	97	97	99	99	97	101	109
113	101	101	101	101	101	93	101	87

References

Mozer, F. S., J. P. McFadden, I. Sircar, and J. Vernetti, Small-comet 'atmospheric holes' are instrument noise, *Geophys. Res. Lett.*, 25, 3713-3716, 1998.

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