



## Bugs: dmmerge

### Caveats

#### 1. *Extra GTI blocks in merged event file (16 Apr 2007)*

This caveat has been updated to use the subspace–editing capability added in CIAO 3.4. The previous title was "When two event files that have different ranges of exposure numbers (`expno` column) are merged, the output file will have two GTI blocks."

When merging ACIS event lists with `dmmerge`, the "data subspace" of the two event lists is combined. Due to a technical subtlety in the way that the `EXPNO` (ACIS frame exposure number) column is defined, this generates unwanted extra GTI extensions in the output file if the exposure numbers are not equal.

```
unix% dmmerge "acisf01587N002_evt2.fits,acisf07073N001_evt2.fits" NGC3379_merge.fits
unix% dmlist NGC3379_merge.fits blocks
-----
Dataset: NGC3379_merge.fits
-----
```

Block Name	Type	Dimensions
Block 1: PRIMARY	Null	
Block 2: EVENTS	Table	15 cols x 1392531 rows
Block 3: GTI7	Table	2 cols x 1 rows
Block 4: GTI2	Table	2 cols x 3 rows
Block 5: GTI5	Table	2 cols x 1 rows
Block 6: GTI6	Table	2 cols x 2 rows
Block 7: GTI3	Table	2 cols x 2 rows
Block 8: GTI8	Table	2 cols x 2 rows
Block 9: GTI7_CPT7	Table	2 cols x 1 rows
Block 10: GTI2_CPT8	Table	2 cols x 2 rows
Block 11: GTI5_CPT9	Table	2 cols x 1 rows
Block 12: GTI6_CPT10	Table	2 cols x 1 rows
Block 13: GTI3_CPT11	Table	2 cols x 2 rows
Block 14: GTI8_CPT12	Table	2 cols x 1 rows

This occurs because the filters could not be combined into a single, valid range for the chip. It is undesirable for further analysis, as the tools cannot use multiple GTI blocks for a single chip, resulting in incorrect exposure values.

#### Workaround:

The subspace–editing capabilities in CIAO 3.4 simplify the workaround for this issue. It is now possible to delete the `EXPNO` subspace before merging the files:

```
unix% dmmerge \
  "acisf01587N002_evt2.fits[subspace -expno],acisf07073N001_evt2.fits[subspace -expno]"
  NGC3379_merge_new.fits
```

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```
unix% dmlist NGC3379_merge_new.fits blocks
```

```
-----  
Dataset: NGC3379_merge_new.fits  
-----
```

Block Name	Type	Dimensions
Block 1: PRIMARY	Null	
Block 2: EVENTS	Table	15 cols x 1392531 rows
Block 3: GTI7	Table	2 cols x 2 rows
Block 4: GTI2	Table	2 cols x 5 rows
Block 5: GTI5	Table	2 cols x 2 rows
Block 6: GTI6	Table	2 cols x 3 rows
Block 7: GTI3	Table	2 cols x 4 rows
Block 8: GTI8	Table	2 cols x 3 rows

There are now just six GTI blocks in the output file.

**Merge\_all users:** a "[subspace -expno]" filter was added to the dmmerge command in merge\_all v3.6 as a workaround for this problem. Users no longer need to filter the data before using it as input to merge\_all.

Note that the addition of the subspace filter means that any user who intends to create lightcurves binned on exposure number from the merged output cannot use merge\_all, since that information is eliminated from the subspace. (In general, lightcurves are binned on time.)

### 2. *The tool sums exposure-related keywords (10 Oct 2007)*

Since dmmerge was designed to combine multiple observations, it *sums* exposure-related keywords (e.g. EXPOSURE, LIVTIME, ONTIME).

When combining an array of chips, e.g. to create a background file for a multi-chip observation, these values should not be summed. The ONTIME/LIVETIME/EXPOSURE keywords should match the value of the aim chip, which is the first GTI block by Chandra convention.

Here is an example of a merged file in which the values are the sum of the four individual ONTIMES, EXPOSUREs, and LIVTIMEs (1500000.0\*4=6000000.0):

```
unix% dmlist merged.fits header | egrep '(ONTIM|EXPOS|LIV)'  
0002 LIVTIME0 1500000.0 [s] Real8 Ontime multiplied by DTCOR  
0003 ONTIME0 1500000.0 [s] Real8 Sum of GTIs  
0004 EXPOSURE0 1500000.0 [s] Real8 Total exposure time, with all known corr. a  
0091 ONTIME 6000000.0 [s] Real8 Sum of GTIs  
0092 LIVETIME 6000000.0 [s] Real8 Ontime multiplied by DTCOR  
0093 EXPOSURE 6000000.0 [s] Real8 Total exposure time, with all kn
```

#### Workaround:

Use `dmhedit` to correct all three header values, e.g.

```
unix% dmhedit merged.fits filelist="" op=add key=EXPOSURE value=1500000.0 unit=s
```

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## Bugs

### 1. *Corrupt output if text columns of different lengths are merged.*

dmmerge does not check the the length of text columns before merging files. If the columns are different lengths, then the output is corrupted.

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URL:  
<http://cxc.harvard.edu/ciao3.4/bugs/dmmerge.html>  
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