

ScienceTools on RHEL7

13 Sept 2016

Requested write access to u35 and u52, cannot delete files or create directories. That has now been fixed.

9 Aug 2016

All current external libraries are now available on RHEL7.

Testing ScienceTools-11-03-00 (/nfs/farm/g/glast/u52/rhel7-test) So far everything looks ok.

test_evtbin

Despite looking like failure - this is probably ok.

```
This is test_evtbin version ScienceTools-11-03-00
Expected: failed to create a BinConfig before prototypes were loaded: BinConfig::create was unable to find a
configuration for mission "GLAST", instrument "LAT" while processing file "/nfs/farm/g/glast/u52/rhel7-test
/ScienceTools-scons/data/evtbin/ft1tiny.fits"
Error encountered at /afs/slac.stanford.edu/g/glast/ground/GLAST_EXT/redhat7-x86_64-64bit-gcc48/Healpix_3.30/src
/cxx/Healpix_cxx/healpix_base.cc, line 701
(function void T_Healpix_Base<I>::Set(int, Healpix_Ordering_Scheme) [with I = int])

bad order

Expected: failed to create a Healpix Binner with order -1 : bad order
Expected: failed to create a Healpix Binner with order 13 : Order needs to be positive and <=12
test_evtbin: WARNING: No spacecraft file: EXPOSURE keyword will be set equal to ontime.
test_evtbin: WARNING: No spacecraft file: EXPOSURE keyword will be set equal to ontime.
```

test_dataSubselector

```
bash-4.2$ test_dataSubselector
.....
OK (17 tests)
```

test_Likelihood

```
bash-4.2$ test_Likelihood
.....
OK (34 tests)
```

test_astro

```
bash-4.2$ test_astro
Quaternion tests ok
Rocking test:
time    lat    lon    raz    decz
0       28.6921  -91.2546  10     -10
600     22.3553  -52.5554  50.6662  57.2057
1200    7.02699  -19.3902  86.3382  41.98
```

1800	-10.7582	11.4266	119.662	24.3138
2400	-24.7011	45.7546	156.497	10.4643
3000	-28.379	85.1996	198.449	6.81095
3600	-19.5844	122.853	238.608	15.5467
4200	-3.18458	155.039	273.302	31.8367
4800	14.3146	-173.852	306.918	-20.7812
5400	26.5548	-138.252	345.025	-8.62301
6000	27.4515	-98.4513	27.3318	-7.73227
6600	16.4585	-62.0283	66.2617	-18.6517
7200	-0.707445	-30.5847	100.212	-35.7027
7800	-17.6299	1.09876	134.402	-52.5119
8400	-27.8576	37.9818	173.792	-62.6711
9000	-25.9426	77.7023	216.02	-60.769
9600	-13.0478	112.834	253.658	-47.9605
10200	4.58849	143.803	287.134	39.5578
10800	20.6351	176.32	322.158	55.497
11400	28.5648	-145.619	2.72531	63.3736
12000	23.903	-106.404	44.4476	58.743
12600	9.42043	-72.5152	80.8432	44.3574
13200	-8.39775	-41.7325	114.133	26.6585
13800	-23.2597	-8.16298	150.209	11.896
14400	-28.6507	30.8472	191.726	6.5411
15000	-21.3948	69.1956	232.581	13.7484
15600	-5.64161	101.981	267.874	29.3962

Reading history file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/astro/history_test.txt

Read history file test

time	lat	lon	raz	decz	rax	decz	razen	deczen	
2210	18.5155	122.063	218.534	-14.0025	313.233	-18.185	232.011	18.3916	
2215	18.3961	122.348	218.781	-14.0952	313.492	-18.1133	232.31718	273	
2220	18.2763	122.633	219.028	-14.1877	313.752	-18.0412	232.62318	154	
2225	18.156	122.917	219.274	-14.2846	314.01	-17.9652	232.92818	0344	
2230	18.0352	123.201	219.52	-14.3811	314.267	-17.8888	233.23317	9144	
2235	17.9139	123.485	219.766	-14.4774	314.524	-17.812	233.538	17.7939	
2240	17.7921	123.768	220.012	-14.5734	314.781	-17.7347	233.84217	673	
2245	17.6698	124.051	220.259	-14.6691	315.038	-17.6571	234.14517	5515	
2250	17.5471	124.333	220.505	-14.7645	315.295	-17.5791	234.44917	4297	
2255	17.424	124.615	220.75	-14.8643	315.55	-17.4969	234.75217	3073	
2260	17.3003	124.897	220.995	-14.9638	315.804	-17.4144	235.05417	1845	
2265	17.1762	125.178	221.241	-15.0629	316.058	-17.3314	235.35617	0612	
2270	17.0517	125.459	221.486	-15.1618	316.312	-17.248	235.658	16.9375	

trying time that is not in the range...

caught expected exception PointingHistory: Time out of Range!:

Time (1000000) occurs 997690s after the range of times in the pointing database: (900, 2310)

GPS tests OK

JIRA OBS-14

252460796 2008-12-31T23:59:55.0000

252460797 2008-12-31T23:59:56.0000

252460798 2008-12-31T23:59:57.0000

252460799 2008-12-31T23:59:58.0000

252460800 2008-12-31T23:59:59.0000

252460801 2008-12-31T23:59:59.0000

252460802 2009-01-01T00:00:00.0000

252460803 2009-01-01T00:00:01.0000

252460804 2009-01-01T00:00:02.0000

252460805 2009-01-01T00:00:03.0000

EarthCoordinate:

latitude at t0 = 28.6921 , longitude at t0 = 93.8012

Barycenter coords for JD: 2454101.5: (84.705662,-445.13234,-192.92216)

tests ok

Testing EarthCoordinate::insideSAA...Done.

galactic center corresponds to Ra = 266.405 , Dec = -28.936172

HTM check OK

Maximum delta for HealpixProj is 0.026767302

MET = 245000000 is 2008-10-06T15:33:19.0000

Mission start is: 2001-01-01T00:00:00.0000

JD Conversions passed!

WARNING: Requested year, 2019.5664, is within six months of the end of valid range (1900-2020) for the IGRF-12 model.

WARNING: Requested year, 2019.6515, is within six months of the end of valid range (1900-2020) for the IGRF-12 model.

WARNING: Requested year, 2019.7365, is within six months of the end of valid range (1900-2020) for the IGRF-12

model.

WARNING: Requested year, 2019.8187, is within six months of the end of valid range (1900-2020) for the IGRF-12 model.

WARNING: Requested year, 2019.9038, is within six months of the end of valid range (1900-2020) for the IGRF-12 model.

WARNING: Requested year, 2019.9861, is within six months of the end of valid range (1900-2020) for the IGRF-12 model.

test_tip

```
bash-4.2$ test_tip
```

Expected: opening non-existent.pha threw exception: File not found: non-existent.pha

Expected: opening ft1.tpl threw exception: File not in FITS or Root format: /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/ft1.tpl

Expected: opening directory threw exception: File not in FITS or Root format: /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip

Expected: opening extension NON_EXIS in a1.pha threw exception: Could not open FITS extension "/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha[NON_EXIS]" (CFITSIO ERROR 301: illegal HDU number)

Expected: opening extension NON_EXIS in merit.root threw exception: Could not find tree NON_EXIS

Expected: reading primary extension in a1.pha did not throw an exception.

Expected: reading SPECTRUM extension in a1.pha did not throw an exception.

Expected: editing primary extension in a1.pha did not throw an exception.

Expected: editing SPECTRUM extension in a1.pha did not throw an exception.

Expected: Header::formatTime formatted a time correctly

*	0	*	374.327	*	0
*	1	*	1152.76	*	1
*	2	*	225.125	*	0
*	3	*	339.412	*	1
*	4	*	797.717	*	1
*	5	*	217.756	*	1
*	6	*	460.384	*	1
*	7	*	132.994	*	1
*	8	*	909.006	*	1
*	9	*	54.7509	*	1
*	10	*	377.058	*	1
*	11	*	327.884	*	1
*	12	*	855.155	*	1
*	13	*	68.1083	*	1
*	14	*	128.223	*	1
*	15	*	175.144	*	1
*	16	*	378.895	*	1
*	17	*	66.3761	*	1
*	18	*	497.059	*	1
*	19	*	372.792	*	1
*	20	*	138.826	*	1
*	21	*	979.498	*	1
*	22	*	1098.58	*	1
*	23	*	122.555	*	1
*	24	*	78.7233	*	1
*	25	*	55.0019	*	1
*	26	*	484.899	*	1
*	27	*	60.0689	*	1
*	28	*	212.061	*	1
*	29	*	1121.37	*	1
*	30	*	67.4642	*	1
*	31	*	1120.15	*	1
*	32	*	864.572	*	1
*	33	*	725.815	*	1
*	34	*	57.3049	*	1
*	35	*	58.5294	*	1
*	36	*	105.422	*	1
*	37	*	131.474	*	1
*	38	*	441.024	*	1
*	39	*	744.842	*	1
*	40	*	424.88	*	1
*	41	*	439.898	*	1
*	42	*	257.545	*	1

```

* 43 * 631.428 * 1
* 44 * 307.979 * 1
* 45 * 916.037 * 1
* 46 * 445.65 * 1
* 47 * 105.197 * 1
* 48 * 860.607 * 1
* 49 * 636.989 * 1
* 50 * 58.5365 * 1
* 51 * 272.887 * 1
* 52 * 148.361 * 1
* 53 * 62.2127 * 1
* 54 * 59.9663 * 1
* 55 * 51.2032 * 1
* 56 * 76.1884 * 1
* 57 * 459.034 * 1
* 58 * 67.8209 * 1
* 59 * 50.4061 * 1
* 60 * 502.071 * 1
* 61 * 717.14 * 1
* 62 * 1923.83 * 1
* 63 * 957.37 * 1

```

```

Expected: writing a comment string to a newly created header succeeded
Expected: writing a history string to a newly created header succeeded
Expected behavior: failure creating FitsTable with blank file name and blank extension name
  what() == Could not open FITS extension "" (CFITSIO ERROR 104: could not open the named file)
Expected behavior: failure creating FitsTable with blank file name and non-blank extension name
  what() == Could not open FITS extension "[/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha]" (CFITSIO ERROR 104: could not open the named file)
Expected behavior: failure creating FitsTable with a non-existent file name and blank extension name
  what() == Could not open FITS extension "non-existent-file.fits" (CFITSIO ERROR 104: could not open the named file)
Expected behavior: failure creating FitsTable with a non-existent file name and valid extension name
  what() == Could not open FITS extension "non-existent-file.fits[SPECTRUM]" (CFITSIO ERROR 104: could not open the named file)
Expected behavior: failure creating FitsTable with an existent file and non-existent extension name
  what() == Could not open FITS extension "/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha[NON_EXISTENT]" (CFITSIO ERROR 301: illegal HDU number)
Expected behavior: success creating FitsImage with valid file name and valid extension name
Expected behavior: success creating FitsTable with valid file name and valid extension name
Expected behavior: failure reading unnamed keyword from a const table object
  what() == Cannot read keyword "" in extension "SPECTRUM" in file "/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha" (CFITSIO ERROR 202: keyword not found in header)
Expected behavior: failure reading non-existent keyword from a const table object
  what() == Cannot read keyword "fake_kwd" in extension "SPECTRUM" in file "/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha" (CFITSIO ERROR 202: keyword not found in header)
Expected behavior: failure calling getFieldIndex("fake_fld") from a const table object
  what() == Could not get field index for field fake_fld in extension "SPECTRUM" in file "/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha"
Expected behavior: failure calling getNumElements(-1) from a const table object
  what() == FitsTable::getColumn const called with invalid index in extension "SPECTRUM" in file "/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha"
Expected behavior: failure reading a table cell from a const table object
  what() == FitsTable::getColumn const called with invalid index in extension "SPECTRUM" in file "/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha"
Expected behavior: success calling getKeyword("src_thet") from a const table object
Expected behavior: success calling Keyword::getComment from a const table object
Expected behavior: success calling Keyword::getUnit from a const table object
Expected behavior: success calling Keyword::setUnit for a table object
Expected behavior: success calling Keyword::getUnit from a const table object
Expected behavior: success calling Keyword::setComment for a table object
Expected behavior: after inserting TESTKEY, keyword 44 had expected value "QUALITY = 0 / All values are good"
Expected behavior: after inserting TESTKEY, keyword 45 had expected value "TESTKEY = 'Test keyword value'"
Expected behavior: after inserting TESTKEY, keyword 46 had expected value "CZT_SN = 0 / S/N of CZT Bd [1-999]"
Expected behavior: after appending ENDKEY, last keyword in header had expected value "ENDKEY = 'Test end keyword value'"
Expected behavior: getFieldIndex("channel") succeeded for const table object
Expected behavior: getNumRecords() succeeded for const table object
Expected behavior: getNumElements("0") succeeded for const table object
Expected behavior: number of elements is 1, and IColumn::isScalar() returned true

```

Expected behavior: getColumn(0)->get(ii, tmp_dv) succeeded for all 128 records in const table object

Error in <TFile::TFile>: file name is not specified

Expected behavior: failure creating RootTable with blank file name and blank extension name

what() == Could not open ROOT file

Error in <TFile::TFile>: file name is not specified

Expected behavior: failure creating RootTable with blank file name and non-blank extension name

what() == Could not open ROOT file

Error in <TFile::TFile>: file non-existent-file.fits does not exist

Expected behavior: failure creating RootTable with a non-existent file name and blank extension name

what() == Could not open ROOT file non-existent-file.fits

Error in <TFile::TFile>: file non-existent-file.fits does not exist

Expected behavior: failure creating RootTable with a non-existent file name and valid extension name

what() == Could not open ROOT file non-existent-file.fits

Expected behavior: failure creating RootTable with an existent file and non-existent extension name

what() == Could not find tree NON_EXISTENT

Expected behavior: success creating RootTable with valid file name and valid extension name

Expected behavior: failure reading unnamed keyword from a const table object

what() == Header method getKeyword(const std::string &, double &) const is not supported for the Root implementation

Expected behavior: failure reading non-existent keyword from a const table object

what() == Header method getKeyword(const std::string &, double &) const is not supported for the Root implementation

Expected behavior: failure calling getFieldIndex("fake_fld") from a const table object

what() == leaf fake_fld was not found in extension 1 in file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/merit.root

Expected behavior: failure calling getNumElements(-1) from a const table object

what() == RootTable::getColumn const was passed invalid index in extension 1 in file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/merit.root

Expected behavior: failure reading a table cell from a const table object

what() == RootTable::getColumn const was passed invalid index in extension 1 in file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/merit.root

Expected behavior: getFieldIndex("McEnergy") succeeded for const table object

Expected behavior: getNumRecords() succeeded for const table object

Expected behavior: getNumElements("0") succeeded for const table object

Expected behavior: number of elements is 1, and IColumn::isScalar() returned true

Expected behavior: getColumn(0)->get(ii, tmp_dv) succeeded for all 128 records in const table object

Expected behavior: attempt to open extension SPECTRUM in write-protected file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha succeeded

Expected behavior: attempt to write keyword in a non-const object whose file cannot be written to failed

what() == Cannot write keyword "telescope"; object is not writable in extension "SPECTRUM" in file "/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha"

Expected behavior: attempt to resize a non-const table object whose file cannot be written to failed

what() == setNumRecords called, but object is not writable in extension "SPECTRUM" in file "/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha"

Expected behavior: attempt to write a value in a cell of a non-const table object whose file cannot be written to failed

what() == FitsColumn::setScalar called for a read-only file

Expected behavior: attempt to open read-only extension SPECTRUM in a writable file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha succeeded

Expected behavior: attempt to write keyword in a non-const object whose file cannot be written to failed

what() == Cannot write keyword "telescope"; object is not writable in extension "SPECTRUM" in file "/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha"

Expected behavior: attempt to resize a non-const table object whose file cannot be written to failed

what() == setNumRecords called, but object is not writable in extension "SPECTRUM" in file "/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha"

Expected behavior: attempt to write a value in a cell of a non-const table object whose file cannot be written to failed

what() == FitsColumn::setScalar called for a read-only file

Expected behavior: attempt to open writable extension SPECTRUM in file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha succeeded

Expected behavior: attempt to confirm vector field is not considered a scalar succeeded

Expected behavior: attempt to change number of elements in a fixed width field succeeded

Expected behavior: attempt to confirm change to number of elements in a field succeeded

Expected behavior: attempt to confirm that a field which used to be a vector is now a scalar succeeded

Expected behavior: TestExtensionData::testCopy: using copyCell to copy cells from input to output ITabularData succeeded.

Expected behavior: TestExtensionData::testKeywordItor successfully tested keyword sequence iterator.

Expected behavior: TestExtensionData::testKeywordItor after erasing keyword using iterator there is one fewer keyword

Expected behavior: TestExtensionData::testKeywordItor after erasing keyword using iterator final keyword is different

Expected behavior: TestExtensionData::testKeywordIterator after appending keyword using iterator there is one more keyword

Expected behavior: TestExtensionData::testKeywordIterator after erasing keyword using key name, found expected number of keywords

Expected behavior: TestExtensionData::testKeywordIterator after erasing keyword using key name final keyword is different

Expected behavior: TestExtensionData::testKeywordIterator: non-const find found keyword HV_BIAS

Expected behavior: TestExtensionData::testKeywordIterator: non-const find did not find non-existent keyword NON_EXIS

Expected behavior: TestExtensionData::testKeywordIterator: const find found keyword HV_BIAS

Expected behavior: TestExtensionData::testKeywordIterator: const find did not find non-existent keyword NON_EXIS

Expected behavior: opening SPECTRUM extension of /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha succeeded

Expected behavior: opening TTree "1" extension of /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/merit.root succeeded

Expected behavior: opening TTree "pointing_history" extension of /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/FT2.root succeeded

Expected behavior: getting field container from FITS table succeeded

Expected behavior: getting field container from Root table succeeded

Expected behavior: getting scalar-valued "chanNl" cell into a local vector variable failed
what() == FitsColumn::getVector was called but field is not a vector

Expected behavior: testing reading FITS table succeeded

Expected behavior: writing scalar-valued "chanNl" cell from a local vector variable failed
what() == FitsColumn::setVector called but field is not a vector

Expected behavior: testing writing FITS table succeeded

Expected behavior: getting scalar-valued "chanNl" cell into a local vector variable failed
what() == FitsColumn::getVector was called but field is not a vector

Expected behavior: testing reading FITS table values which were just written succeeded

Expected behavior: writing scalar-valued "chanNl" cell from a local vector variable failed
what() == FitsColumn::setVector called but field is not a vector

Expected behavior: testing restoring FITS table to its original state succeeded

Expected behavior: getting scalar-valued "chanNl" cell into a local vector variable failed
what() == FitsColumn::getVector was called but field is not a vector

Expected behavior: testing reading restored values succeeded

Expected behavior: getting scalar-valued "McEnergy" cell into a local vector variable failed
what() == RootColumn::get(Index_t, double &): Cannot convert scalar to vector

Expected behavior: reading McEnergy field from Root table succeeded

Expected behavior: Reading McEnergy field in FT2.root as a float succeeded

Expected behavior: Reading McEnergy field in FT2.root as a int succeeded

Expected behavior: Reading McEnergy field in FT2.root as a uint succeeded

Expected behavior: Reading McEnergy field in FT2.root as a long succeeded

Expected behavior: Reading McEnergy field in FT2.root as a ulong succeeded

Expected behavior: getting vector-valued "c0Unts" cell into a local scalar variable failed
what() == FitsColumn::getScalar was called but field is not a scalar

Expected behavior: setting vector-valued "c0Unts" cell from a local scalar variable failed
what() == FitsColumn::setScalar called but field is not a scalar

Expected behavior: getting vector-valued "c0Unts" cell as a vector<string> variable succeeded

Expected behavior: appending field to Root table failed
what() == Adding fields to a Root table is not supported

Expected behavior: appending field to FITS table succeeded

Expected behavior: appending vector bool field to FITS table succeeded

Expected behavior: appending vector short field to FITS table succeeded

Expected behavior: appending string field to FITS table succeeded

Expected behavior: appending field which already exists to FITS table failed
what() == Cannot add field new_Chan because field NEW_chan already exists in extension "SPECTRUM" in file "/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha"

Expected behavior: copyFieldTest() succeeded copying one table's fields to another using Cell::operator =

Expected behavior: copyFieldTest() succeeded copying one table's fields to another using Record::operator =

Expected behavior: copyFieldTest() failed to copy a cell to a Root file
what() == Copying cells to a Root table is not supported

Expected behavior: copyFieldTest() failed to copy a record to a Root file
what() == Copying records to a Root table is not supported

Expected behavior: TestTable::singleFieldBugTest had no problem editing a table containing a single column

Expected behavior: TestTable::unsignedIntTest reading and writing unsigned int is consistent.

Expected behavior: TestTable::unsignedIntTest: SHORT column format read agrees with the format used to create column

Expected behavior: TestTable::unsignedIntTest: USHORT column format read agrees with the format used to create column

Expected behavior: TestTable::unsignedIntTest: UINT column format read agrees with the format used to create column

Expected behavior: TestTable::unsignedIntTest: INT column format read agrees with the format used to create column

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Expected behavior: TestTable::unsignedIntTest: FLOAT column format read agrees with the format used to create column
Expected behavior: TestTable::unsignedIntTest: SCALED column format read agrees with the format used to create column
Expected behavior: Reading sc_position field in FT2.root as a scalar failed
    what() == RootColumn::get(Index_t, double &): Cannot convert vector to scalar
Expected behavior: sc_position from FT2.root had expected values
Expected behavior: Reading sc_position field in FT2.root as a vector<float> succeeded
Expected behavior: Reading sc_position field in FT2.root as a vector<int> succeeded
Expected behavior: Reading sc_position field in FT2.root as a vector<uint> succeeded
Expected behavior: Reading sc_position field in FT2.root as a vector<long> succeeded
Expected behavior: Reading sc_position field in FT2.root as a vector<ulong> succeeded
WARNING: Tip was compiled without "long long" indexing; skipping large file test
Expected behavior: creating file in an invalid location /invalid/directory/file failed
    what() == Unable to create file named "!/invalid/directory/file" (CFITSIO ERROR 105: couldn't create the named file)
Expected behavior: creating file IFileSvc_error.fits using a non-existent template
    /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/non_existent.tpl failed
    what() == Unable to create file named "IFileSvc_error.fits(/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/non_existent.tpl)" (CFITSIO ERROR 366: file open failed (parser))
Expected behavior: creating file IFileSvc_success.fits using template
    /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/ft1.tpl succeeded
Expected behavior: creating file IFileSvc_success.fits using template
    /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/ft1.tpl succeeded
Expected behavior: creating file new.fits using no template succeeded
Expected behavior: re-creating file IFileSvc_success.fits with clobber false using template
    /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/ft1.tpl failed
    what() == Unable to create file named "IFileSvc_success.fits(/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/ft1.tpl)" (CFITSIO ERROR 105: couldn't create the named file)
Expected behavior: re-creating file IFileSvc_success.fits with clobber false without template failed
    what() == Unable to create file named "IFileSvc_no_template.fits" (CFITSIO ERROR 105: couldn't create the named file)
Expected behavior: TestFileManager::editExtensionTest opening read-write extension SPECTRUM of file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha succeeded
Expected behavior: TestFileManager::readExtensionTest opening read-only extension SPECTRUM of file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha succeeded
Expected behavior: TestFileManager::readTableTest opening read-only extension SPECTRUM of file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha succeeded
Expected behavior: with filtering expression, number of records in table is 50, as expected
Expected behavior: IFileSvc::fileExists found file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha
Expected behavior: IFileSvc::fileExists did not find file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/non_existent.pha
Expected behavior: FitsFileManager::isValid correctly recognized FITS file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha
Expected behavior: FitsFileManager::isValid correctly failed to recognize file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/non_existent.pha
Expected behavior: FitsFileManager::isValid correctly failed to recognize file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/merit.root
Expected behavior: RootTable::isValid correctly recognized Root file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/merit.root
Expected behavior: RootTable::isValid correctly failed to recognize file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/non_existent.pha
Expected behavior: RootTable::isValid correctly failed to recognize file /nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha
Expected behavior: IFileSvc::updateKeywords worked correctly
Expected behavior: TestFileManager::tipFileTest was able to construct and clone ITipFiles
Expected behavior: TestFileManager::tipFileTest copyFile threw exception when copying over an existing file with clobber false.
    what() == FitsTipFile::copyFile could not create file tipfile-copy.fits (CFITSIO ERROR 105: couldn't create the named file)
Expected behavior: TestFileManager::tipFileTest was able to use an ITipFile to copy a file on disk as expected
```

[illegible]

[illegible]

```

Expected behavior: assignment of short string, short comment to key record worked
Expected behavior: assignment of medium string, short comment to key record worked
Expected behavior: assignment of long string, short comment to key record worked
Expected behavior: assignment of number to numeric key record worked
Expected behavior: assignment of boolean to numeric key record worked
Expected behavior: assignment of string to numeric key record threw exception
  what() == KeyRecord::setValue attempted to assign a string to a numeric key record
Expected behavior: assignment of number to blank key record worked
Expected behavior: assignment of string to blank key record worked
Expected behavior: assignment of boolean to blank key record worked
Expected behavior: assignment of primitive bool to blank key record worked
Expected behavior: assignment of primitive bool to numeric key record worked
Expected behavior: assignment of primitive bool to string key record worked
Expected behavior: creation of boolean key record from name, value, comment worked
Expected behavior: KeyRecordTest::test: getValue returned expected string
Expected behavior: KeyRecordTest::test: getValue(bool&) returned expected value
Expected behavior: KeyRecordTest::test: getValue(double&) returned expected value
Expected behavior: KeyRecord::getName behaved as expected.
Expected behavior: KeyRecord::getValue behaved as expected.
Expected behavior: KeyRecord::getComment behaved as expected.
Expected behavior: after applying filter "channel>=32 && channel<64", TestFilter::test found there were 32
records
Expected behavior: after applying filter "", TestFilter::test found there were 32 records
Expected behavior: in TestFilter::test, applying filter "invalid=7." generated exception
  what() == filterRows had an error applying the filtering expression invalid=7. in extension "SPECTRUM" in
file "/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/data/tip/a1.pha" (CFITSIO ERROR 202: keyword not
found in header)
Expected behavior: TestException::test: non-fitsio exception, no status argument gave correct text
Expected behavior: TestException::test: non-fitsio exception, non-zero status argument gave correct text
Expected behavior: TestException::test: non-fitsio exception, zero status argument gave correct text
Expected behavior: TestException::test: fitsio exception, 104 status argument (CFITSIO ERROR 104: could not
open the named file) gave correct text

```

test_st_facilities

```

bash-4.2$ test_st_facilities
.....
OK (7 tests)

```

test_sane

```

bash-4.2$ test_sane
time -p gtobssim infile=xmlFiles.txt srclist=source_names.txt scfile=none sctable="SC_DATA" evroot="test"
evtable="EVENTS" simtime=86400.0 ltfrac=0.9 tstart=86400.0 nevents=no maxtime=315500000.0 startdate="2001-01-01
00:00:00" offset=0 rockangle="INDEF" use_ac=yes ra=90.0 dec=20.0 radius=30.0 emin=100.0 emax=300000.0 edisp=yes
irfs="DC1A" evttype="none" area=1.0 maxrows=1000000 seed=479153 chatter=2 clobber=yes debug=no gui=no mode="ql"
added source "anticenter-32mev"
added source "Galactic_diffuse"
Generating events for a simulation time of 86400 seconds....
Done.
real 52.48
user 46.53
sys 0.18
time -p gtmktime scfile=orbSim_scData_0000.fits sctable="SC_DATA" filter="IN_SAA!=T" roicut=yes
evfile=test_events_0000.fits evtable="EVENTS" outfile="test_events.fits" apply_filter=yes overwrite=no
header_obstimes=yes tstart=0.0 tstop=0.0 gtifile="default" chatter=2 clobber=yes debug=no gui=no mode="ql"
DSS keywords required for ROI-based zenith angle cut
are not present in the FT1 file.
real 1.36
user 0.15
sys 0.06

```

```

time -p gtvcut infile=test_events.fits table="EVENTS" suppress_gtis=yes chatter=2 debug=no gui=no mode="ql"
DSTYP1: ENERGY
DSUNI1: MeV
DSVAL1: 100:300000

DSTYP2: POS(RA, DEC)
DSUNI2: deg
DSVAL2: CIRCLE(90,20,30)

DSTYP3: TIME
DSUNI3: s
DSVAL3: TABLE
DSREF3: :GTI

GTIs: (suppressed)

real 0.72
user 0.11
sys 0.04
time -p gtselect infile=test_events.fits outfile=filtered_events_0000.fits ra=90.0 dec=20.0 rad=20.0 tmin=0.0
tmax=0.0 emin=32.0 emax=200000.0 zmin=0.0 zmax=180.0 evclass="INDEF" evtype="INDEF" convtype=-1 phasemin=0.0
phasemax=1.0 evtable="EVENTS" chatter=2 clobber=yes debug=no gui=no mode="ql"
Done.
real 1.03
user 0.16
sys 0.05
time -p gtvcut infile=filtered_events_0000.fits table="EVENTS" suppress_gtis=yes chatter=2 debug=no gui=no
mode="ql"
DSTYP1: POS(RA, DEC)
DSUNI1: deg
DSVAL1: CIRCLE(90,20,20)

DSTYP2: TIME
DSUNI2: s
DSVAL2: TABLE
DSREF2: :GTI

GTIs: (suppressed)

DSTYP3: ENERGY
DSUNI3: MeV
DSVAL3: 100:200000

real 0.61
user 0.12
sys 0.04
time -p gtselect infile=test_events.fits outfile=filtered1.fits ra=90.0 dec=20.0 rad=20.0 tmin=86400.0
tmax=129600.0 emin=30.0 emax=300000.0 zmin=0.0 zmax=180.0 evclass="INDEF" evtype="INDEF" convtype=-1 phasemin=0.
0 phasemax=1.0 evtable="EVENTS" chatter=2 clobber=yes debug=no gui=no mode="ql"
Done.
real 1.01
user 0.17
sys 0.05
time -p gtvcut infile=filtered1.fits table="EVENTS" suppress_gtis=yes chatter=2 debug=no gui=no mode="ql"
DSTYP1: POS(RA, DEC)
DSUNI1: deg
DSVAL1: CIRCLE(90,20,20)

DSTYP2: TIME
DSUNI2: s
DSVAL2: TABLE
DSREF2: :GTI

GTIs: (suppressed)

DSTYP3: ENERGY
DSUNI3: MeV
DSVAL3: 100:300000

real 0.61
user 0.12

```

```

sys 0.03
time -p gtltcube evfile="filtered1.fits" evttable="EVENTS" scfile=orbSim_scData_0000.fits sctable="SC_DATA"
outfile=expcube1.fits dcostheta=0.05 binsz=1.0 phibins=0 tmin=0.0 tmax=0.0 file_version="1" zmin=0.0 zmax=180.0
chatter=4 clobber=yes debug=no gui=no mode="ql"
This is gtltcube version ScienceTools-11-03-00
applying filter: (START >= 86340) && (STOP <= 129450)
Working on file orbSim_scData_0000.fits
read 1435 rows
.....!
real 10.66
user 8.58
sys 0.77
time -p gtselect infile=test_events.fits outfile=filtered2.fits ra=90.0 dec=20.0 rad=20.0 tmin=129600.0
tmax=172800.0 emin=30.0 emax=300000.0 zmin=0.0 zmax=180.0 evclass="INDEF" evtype="INDEF" convtype=-1 phasemin=0.
0 phasemax=1.0 evttable="EVENTS" chatter=2 clobber=yes debug=no gui=no mode="ql"
Done.
real 0.98
user 0.16
sys 0.05
time -p gtvcut infile=filtered2.fits table="EVENTS" suppress_gtis=yes chatter=2 debug=no gui=no mode="ql"
DSTYP1: POS(RA,DEC)
DSUNI1: deg
DSVAL1: CIRCLE(90,20,20)

DSTYP2: TIME
DSUNI2: s
DSVAL2: TABLE
DSREF2: :GTI

GTIs: (suppressed)

DSTYP3: ENERGY
DSUNI3: MeV
DSVAL3: 100:300000

real 0.59
user 0.11
sys 0.03
time -p gtltcube evfile="filtered2.fits" evttable="EVENTS" scfile=orbSim_scData_0000.fits sctable="SC_DATA"
outfile=expcube2.fits dcostheta=0.05 binsz=1.0 phibins=0 tmin=0.0 tmax=0.0 file_version="1" zmin=0.0 zmax=180.0
chatter=4 clobber=yes debug=no gui=no mode="ql"
This is gtltcube version ScienceTools-11-03-00
applying filter: (START >= 130590) && (STOP <= 172860)
Working on file orbSim_scData_0000.fits
read 1408 rows
.....!
real 10.41
user 8.52
sys 0.76
time -p gtltsun infile1=expcube1.fits infile2=expcube2.fits table="Exposure" table2="WEIGHTED_EXPOSURE"
outfile=expcube_1_day.fits chatter=4 clobber=yes debug=no gui=no mode="ql"
This is gtltsun version ScienceTools-11-03-00
real 1.90
user 0.55
sys 0.53
time -p gtexpmap evfile=filtered_events_0000.fits evttable="EVENTS" scfile=orbSim_scData_0000.fits sctable="
SC_DATA" expcube=expcube_1_day.fits outfile=expMap.fits irfs="DC1A" evtype="INDEF" srcrad=30.0 nlong=120
nlat=120 nenergies=20 submap=no nlongmin=0 nlongmax=0 nlatmin=0 nlatmax=0 chatter=4 clobber=yes debug=no gui=no
mode="ql"
This is gtexpmap version ScienceTools-11-03-00
The exposure maps generated by this tool are meant
to be used for *unbinned* likelihood analysis only.
Do not use them for binned analyses.
ResponseFunctions::load: IRF used: DC1A
event_types: 0 1
Computing the ExposureMap using expcube_1_day.fits
.....!
real 57.30
user 56.26
sys 0.17
time -p gtvcut infile=expMap.fits table="PRIMARY" suppress_gtis=yes chatter=2 debug=no gui=no mode="ql"

```

```

DSTYP1: POS(RA, DEC)
DSUNI1: deg
DSVAL1: CIRCLE(90, 20, 20)

DSTYP2: ENERGY
DSUNI2: MeV
DSVAL2: 100:200000

DSTYP3: TIME
DSUNI3: s
DSVAL3: TABLE
DSREF3: :GTI

GTIs: (suppressed)

DSTYP4: IRF_VERSION
DSUNI4: DIMENSIONLESS
DSVAL4: DC1A

real 0.61
user 0.11
sys 0.04
time -p gtdiffrsp evfile=filtered_events_0000.fits evtable="EVENTS" scfile=orbSim_scData_0000.fits sctable="
SC_DATA" srcmdl=/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/sane/data/srcModel_egretdiffuse.xml irfs="
DC1A" evclsmmin=0 evclass="INDEF" evtype="INDEF" convert=no chatter=4 clobber=yes debug=no gui=no mode="ql"
This is gtdiffrsp version ScienceTools-11-03-00
ResponseFunctions::load: IRF used: DC1A
  event_types: 0 1
Creating source named EGRET Diffuse
MapBase::readFitsFile: creating WcsMap2 object
Creating source named Crab
Creating source named PKS 0528+134
Creating source named Geminga
adding source EGRET Diffuse
Working on...
filtered_events_0000.fitsEventContainer::getEvents:
Out of 3500 events in file filtered_events_0000.fits,
  3500 were accepted, and 0 were rejected.

.....!
real 234.80
user 233.63
sys 0.10
time -p gtvcut infile=filtered_events_0000.fits table="EVENTS" suppress_gtis=yes chatter=2 debug=no gui=no
mode="ql"
DSTYP1: POS(RA, DEC)
DSUNI1: deg
DSVAL1: CIRCLE(90, 20, 20)

DSTYP2: TIME
DSUNI2: s
DSVAL2: TABLE
DSREF2: :GTI

GTIs: (suppressed)

DSTYP3: ENERGY
DSUNI3: MeV
DSVAL3: 100:200000

real 0.60
user 0.12
sys 0.03
time -p gtlike irfs="DC1A" expcube=expcube_1_day.fits srcmdl=/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons
/sane/data/srcModel_egretdiffuse.xml sfile=none check_fit=yes results=results.dat specfile=counts_spectra.fits
statistic="UNBINNED" optimizer="MINUIT" ftol=0.0001 toltype="ABS" tsmin=no save=yes refit=no
evfile=filtered_events_0000.fits evtable="EVENTS" scfile=orbSim_scData_0000.fits sctable="SC_DATA"
expmap=expMap.fits plot=no cmap=none bexpmap=none wmap=none psfcorr=yes phased_expmap=none chatter=3
clobber=yes debug=no gui=no mode="ql"
This is gtlike version ScienceTools-11-03-00
ResponseFunctions::load: IRF used: DC1A

```

event_types: 0 1
EventContainer::getEvents:
Out of 3500 events in file filtered_events_0000.fits,
3500 were accepted, and 0 were rejected.

Creating source named EGRET Diffuse
Creating source named Crab
Creating source named PKS 0528+134
Creating source named Geminga
.....!

```
*****
**      1 **SET PRINT      1.000
*****
*****
**      2 **SET NOWARN
*****

PARAMETER DEFINITIONS:
  NO.   NAME      VALUE      STEP SIZE      LIMITS
  1 'Integral '  1.0000      1.0000      .10000E-04  1000.0
  2 'Index   ' -2.0000      1.0000      -5.0000     -1.0000
  3 'Prefactor ' 11.000      1.0000      .10000E-02  1000.0
  4 'Integral '  1.0000      1.0000      .10000E-04  1000.0
  5 'Index   ' -2.0000      1.0000      -5.0000     -1.0000
  6 'Integral '  1.0000      1.0000      .10000E-04  1000.0
  7 'Index   ' -2.0000      1.0000      -5.0000     -1.0000
*****
**      3 **SET ERR       .5000
*****
*****
**      4 **SET GRAD      1.000
*****
*****
**      5 **MINIMIZE      1500.      .2000
*****
```

FIRST CALL TO USER FUNCTION AT NEW START POINT, WITH IFLAG=4.
START MIGRAD MINIMIZATION. STRATEGY 1. CONVERGENCE WHEN EDM .LT. .20E-03

FCN= 32812.48 FROM MIGRAD STATUS=INITIATE 1 CALLS 2 TOTAL
EDM= unknown STRATEGY= 1 NO ERROR MATRIX

EXT	PARAMETER	VALUE	CURRENT GUESS	STEP	FIRST
NO.	NAME		ERROR	SIZE	DERIVATIVE
1	Integral	1.00000	1.0000	.43760E-01	-1781.5
2	Index	-2.0000	1.0000	.78442	-241.58
3	Prefactor	11.000	1.0000	.95978E-02	-4574.3
4	Integral	1.00000	1.0000	.43760E-01	-4885.3
5	Index	-2.0000	1.0000	.78442	-844.89
6	Integral	1.00000	1.0000	.43760E-01	-559.93
7	Index	-2.0000	1.0000	.78442	-45.940

ERR DEF= .500

MIGRAD MINIMIZATION HAS CONVERGED.

MIGRAD WILL VERIFY CONVERGENCE AND ERROR MATRIX.

FCN= 32156.41 FROM MIGRAD STATUS=CONVERGED 161 CALLS 162 TOTAL
EDM= .28E-05 STRATEGY= 1 ERR MATRIX NOT POS-DEF

EXT	PARAMETER	VALUE	APPROXIMATE	STEP	FIRST
NO.	NAME		ERROR	SIZE	DERIVATIVE
1	Integral	12.155	15.229	.37110E-01	.19677E-01
2	Index	-2.0840	.52073	.78442E-01	.12582E-01
3	Prefactor	11.100	.26082	.84096E-02	.24172
4	Integral	11.390	.81855	.24345E-01	-.58289E-01
5	Index	-1.7038	.27825E-01	.57956E-01	.54878E-01
6	Integral	10.813	4.0665	.43760E-01	.20105E-01
7	Index	-2.5288	.17312	.14234	-.91183E-02

ERR DEF= .500

```

EXTERNAL ERROR MATRIX.      NDIM= 100      NPAR= 7      ERR DEF= .500
.233E+03 -.806E+01 -.244E+01 .329E+00 -.538E-03 .143E+02 .471E+00
-.806E+01 .279E+00 .835E-01 -.112E-01 .197E-04 -.493E+00 -.162E-01
-.244E+01 .835E-01 .680E-01 -.186E-01 -.155E-03 -.721E-01 -.302E-02
.329E+00 -.112E-01 -.186E-01 .670E+00 .155E-01 .524E-02 .350E-03
-.538E-03 .197E-04 -.155E-03 .155E-01 .774E-03 -.766E-04 -.612E-06
.143E+02 -.493E+00 -.721E-01 .524E-02 -.766E-04 .165E+02 .656E+00
.471E+00 -.162E-01 -.302E-02 .350E-03 -.612E-06 .656E+00 .301E-01
ERR MATRIX NOT POS-DEF

PARAMETER CORRELATION COEFFICIENTS
NO. GLOBAL 1 2 3 4 5 6 7
1 .99812 1.000 -.998 -.611 .026 -.001 .230 .178
2 .99810 -.998 1.000 .606 -.026 .001 -.229 -.177
3 .62795 -.611 .606 1.000 -.087 -.021 -.068 -.067
4 .68679 .026 -.026 -.087 1.000 .683 .002 .002
5 .68367 -.001 .001 -.021 .683 1.000 -.001 .000
6 .93314 .230 -.229 -.068 .002 -.001 1.000 .930
7 .93116 .178 -.177 -.067 .002 .000 .930 1.000
ERR MATRIX NOT POS-DEF
Final values:
Integral = 12.155
Index = -2.08405
Prefactor = 11.0996
Integral = 11.3898
Index = -1.70379
Integral = 10.8132
Index = -2.52883
*****
** 6 **HESSE
*****
COVARIANCE MATRIX CALCULATED SUCCESSFULLY

FCN= 32156.41 FROM HESSE STATUS=OK 50 CALLS 212 TOTAL
EDM= .14E-05 STRATEGY= 1 ERROR MATRIX ACCURATE

EXT PARAMETER INTERNAL INTERNAL
NO. NAME VALUE ERROR STEP SIZE VALUE
1 Integral 12.155 2.2395 .16407E-03 -1.3498
2 Index -2.0840 .77225E-01 .35170E-03 6.7589
3 Prefactor 11.100 .23162 .37161E-04 -1.3597
4 Integral 11.390 1.1859 .10754E-03 -1.3569
5 Index -1.7038 .40110E-01 .25571E-03 15.003
6 Integral 10.813 4.1094 .27118E-03 -1.7791
7 Index -2.5288 .17933 .62369E-03 -6.0454
ERR DEF= .500

EXTERNAL ERROR MATRIX.      NDIM= 100      NPAR= 7      ERR DEF= .500
.502E+01 -.153E+00 -.800E-01 .370E-01 .710E-03 .330E+00 .114E-01
-.153E+00 .597E-02 .161E-02 -.639E-03 -.114E-04 -.933E-02 -.323E-03
-.800E-01 .161E-02 .536E-01 -.401E-01 -.864E-03 .902E-01 .184E-02
.370E-01 -.639E-03 -.401E-01 .141E+01 .396E-01 -.376E-01 -.476E-03
.710E-03 -.114E-04 -.864E-03 .396E-01 .161E-02 -.673E-03 -.556E-05
.330E+00 -.933E-02 .902E-01 -.376E-01 -.673E-03 .169E+02 .679E+00
.114E-01 -.323E-03 .184E-02 -.476E-03 -.556E-05 .679E+00 .322E-01

PARAMETER CORRELATION COEFFICIENTS
NO. GLOBAL 1 2 3 4 5 6 7
1 .88885 1.000 -.885 -.154 .014 .008 .036 .028
2 .88674 -.885 1.000 .090 -.007 -.004 -.029 -.023
3 .28028 -.154 .090 1.000 -.146 -.093 .095 .044
4 .83532 .014 -.007 -.146 1.000 .832 -.008 -.002
5 .83295 .008 -.004 -.093 .832 1.000 -.004 -.001
6 .92140 .036 -.029 .095 -.008 -.004 1.000 .920
7 .92069 .028 -.023 .044 -.002 -.001 .920 1.000
Minuit fit quality: 3 estimated distance: 1.40233e-06
Minuit parameter uncertainties:
1 2.23966
2 0.0772497
3 0.231623
4 1.18588

```

```

5  0.0401144
6  4.11047
7  0.179581
....!
Computing TS values for each source (4 total)

Photon fluxes are computed for the energy range 100 to 200000 MeV

Crab:
Integral: 12.155 +/- 2.23966
Index: -2.08405 +/- 0.0772497
LowerLimit: 20
UpperLimit: 200000
Npred: 242.222
ROI distance: 6.3295
TS value: 468.148
Flux: 2.12421e-06 +/- 1.99726e-07 photons/cm^2/s

EGRET Diffuse:
Prefactor: 11.0996 +/- 0.231623
Index: -2.1
Scale: 100
Npred: 2745.74
Flux: 0.000456278 +/- 9.51586e-06 photons/cm^2/s

Geminga:
Integral: 11.3898 +/- 1.18588
Index: -1.70379 +/- 0.0401144
LowerLimit: 20
UpperLimit: 200000
Npred: 414.101
ROI distance: 8.3097
TS value: 1723.39
Flux: 3.65839e-06 +/- 5.88984e-07 photons/cm^2/s

PKS 0528+134:
Integral: 10.8132 +/- 4.11047
Index: -2.52883 +/- 0.179581
LowerLimit: 20
UpperLimit: 200000
Npred: 97.9565
ROI distance: 9.59745
TS value: 99.5038
Flux: 9.24358e-07 +/- 6.05517e-07 photons/cm^2/s
WARNING: Fit may be bad in range [213.847, 312.719] (MeV)

Total number of observed counts: 3500
Total number of model events: 3500.02

-log(Likelihood): 32156.40502

Elapsed CPU time: 12.63
real 13.74
user 12.68
sys 0.14
Crab
  Spectrum: PowerLaw2
0      Integral:  1.218e+01  2.241e+00  1.000e-05  1.000e+03 ( 1.000e-06)
1      Index:    -2.085e+00  7.720e-02 -5.000e+00 -1.000e+00 ( 1.000e+00)
2      LowerLimit: 2.000e+01  0.000e+00  2.000e+01  2.000e+05 ( 1.000e+00) fixed
3      UpperLimit: 2.000e+05  0.000e+00  2.000e+01  2.000e+05 ( 1.000e+00) fixed

EGRET Diffuse
  Spectrum: PowerLaw
4      Prefactor:  1.110e+01  2.316e-01  1.000e-03  1.000e+03 ( 1.000e-03)
5      Index:    -2.100e+00  0.000e+00 -3.500e+00 -1.000e+00 ( 1.000e+00) fixed
6      Scale:     1.000e+02  0.000e+00  5.000e+01  2.000e+02 ( 1.000e+00) fixed

Geminga
  Spectrum: PowerLaw2

```



```

7      Integral:  1.139e+01  1.186e+00  1.000e-05  1.000e+03 ( 1.000e-06)
8      Index:    -1.704e+00  4.011e-02 -5.000e+00 -1.000e+00 ( 1.000e+00)
9      LowerLimit: 2.000e+01  0.000e+00  2.000e+01  2.000e+05 ( 1.000e+00) fixed
10     UpperLimit: 2.000e+05  0.000e+00  2.000e+01  2.000e+05 ( 1.000e+00) fixed

```

PKS 0528+134

Spectrum: PowerLaw2

```

11     Integral:  1.081e+01  4.155e+00  1.000e-05  1.000e+03 ( 1.000e-06)
12     Index:    -2.529e+00  1.817e-01 -5.000e+00 -1.000e+00 ( 1.000e+00)
13     LowerLimit: 2.000e+01  0.000e+00  2.000e+01  2.000e+05 ( 1.000e+00) fixed
14     UpperLimit: 2.000e+05  0.000e+00  2.000e+01  2.000e+05 ( 1.000e+00) fixed

```

Ts values:

Crab 468.141922683

EGRET Diffuse 4.6e+31

Geminga 1723.394982

PKS 0528+134 99.5015141918

Exercise UpperLimits.py

Info in <Minuit2>: VariableMetricBuilder: Tolerance is not sufficient, continue the minimization

Info in <Minuit2>: Current Edm is : edm = 0.00243187

Info in <Minuit2>: Required Edm is : edmval = 0.002

Info in <Minuit2>: VariableMetricBuilder: Tolerance is not sufficient, continue the minimization

Info in <Minuit2>: Current Edm is : edm = 0.00202712

Info in <Minuit2>: Required Edm is : edmval = 0.002

0 12.1759138504 -3.89065280615e-05 2.12580546324e-06

1 12.8534138504 0.0464672806229 2.17250373333e-06

2 13.5309138504 0.171753884413 2.21674873776e-06

3 14.2084138504 0.364490870554 2.25885725792e-06

4 14.8859138504 0.615180435878 2.29892830279e-06

5 15.5634138504 0.915826330674 2.33694677599e-06

6 16.2409138504 1.25964807016 2.37360424633e-06

7 16.6117672717 1.46288143897 2.39282944572e-06

Crab 2.38262422112e-06

Exercise IntegralUpperLimit.py

Info in <Minuit2>: VariableMetricBuilder: Tolerance is not sufficient, continue the minimization

Info in <Minuit2>: Current Edm is : edm = 0.00230245

Info in <Minuit2>: Required Edm is : edmval = 0.002

Info in <Minuit2>: VariableMetricBuilder: Tolerance is not sufficient, continue the minimization

Info in <Minuit2>: Current Edm is : edm = 0.00384981

Info in <Minuit2>: Required Edm is : edmval = 0.002

Info in <Minuit2>: VariableMetricBuilder: Tolerance is not sufficient, continue the minimization

Info in <Minuit2>: Current Edm is : edm = 0.0030095

Info in <Minuit2>: Required Edm is : edmval = 0.002

Info in <Minuit2>: VariableMetricBuilder: Tolerance is not sufficient, continue the minimization

Info in <Minuit2>: Current Edm is : edm = 0.00204942

Info in <Minuit2>: Required Edm is : edmval = 0.002

Crab 2.18749862044e-06

time -p gtselect infile=test_events_0000.fits outfile=filtered_events.fits ra="INDEF" dec="INDEF" rad="INDEF"
tmin="INDEF" tmax="INDEF" emin=30.0 emax=300000.0 zmin=0.0 zmax=180.0 evclass="INDEF" evtype="INDEF" convtype=-
1 phasemin=0.0 phasemax=1.0 evtable="EVENTS" chatter=2 clobber=yes debug=no gui=no mode="ql"

Done.

real 1.03

user 0.16

sys 0.07

time -p gtbin evfile=filtered_events.fits scfile=orbSim_scData_0000.fits outfile=countsMap.fits algorithm="CCUBE" ebinalg="LOG" emin=100.0 emax=200000.0 enumbins=30 ebinfile=NONE tbinalg="LIN" tbinfile=NONE nxpix=160 nypix=160 binsz=0.25 coordsys="CEL" xref=90.0 yref=20.0 axisrot=0.0 rafield="RA" decfield="DEC" proj="STG" hpx_ordering_scheme="RING" hpx_order=3 hpx_ebin=yes hpx_region="" evtable="EVENTS" scfile="SC_DATA" efield="ENERGY" tfield="TIME" chatter=2 clobber=yes debug=no gui=no mode="ql"

This is gtbin version ScienceTools-11-03-00

real 1.91

user 0.35

sys 0.22

time -p gtlcube evfile="filtered_events.fits" evtable="EVENTS" scfile=orbSim_scData_0000.fits scfile="SC_DATA" outfile=lrcube.fits dcostheta=0.025 binsz=1.0 phibins=0 tmin=0.0 tmax=0.0 file_version="1" zmin=0.0 zmax=180.0 chatter=2 clobber=yes debug=no gui=no mode="ql"

Working on file orbSim_scData_0000.fits

.....!

real 19.96

user 17.12

sys 1.41

```

time -p gtexpcube2 infile=ltcube.fits cmap=countsMap.fits outfile=bexpmap.fits irfs="DC1A" evtype="INDEF"
nxpix="INDEF" nypix="INDEF" binsz="INDEF" coordsys="GAL" xref="INDEF" yref="INDEF" axisrot=0.0 proj="CAR"
ebinalg="LOG" emin="INDEF" emax="INDEF" enumbins="INDEF" ebinfile="NONE" bincalc="EDGE" ignorephi=no thmax=180.
0 thmin=0.0 table="EXPOSURE" chatter=2 clobber=yes debug=no mode="ql"
Computing binned exposure map.....!
real 26.00
user 24.90
sys 0.30
time -p gtexpcube2 infile=ltcube.fits cmap=countsMap.fits outfile=bexpmap_allsky.fits irfs="DC1A" evtype="
INDEF" nxpix=360 nypix=180 binsz=1.0 coordsys="GAL" xref=0.0 yref=0.0 axisrot=0.0 proj="CAR" ebinalg="LOG"
emin="INDEF" emax="INDEF" enumbins="INDEF" ebinfile="NONE" bincalc="EDGE" ignorephi=no thmax=180.0 thmin=0.0
table="EXPOSURE" chatter=2 clobber=yes debug=no mode="ql"
Computing binned exposure map.....!
real 61.98
user 60.61
sys 0.56
time -p gtsrcmaps scfile=orbSim_scData_0000.fits sctable="SC_DATA" expcube=ltcube.fits cmap=countsMap.fits
srcmdl=/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/sane/data/srcModel_egretdiffuse.xml bexpmap=bexpmap.
fits wmap=none outfile=sourceMaps.fits irfs="DC1A" evtype="INDEF" convol=yes resample=yes rfactor=2 minbinsz=0.
1 ptsrc=yes psfcorr=yes emapbnds=yes copyall=no chatter=2 clobber=yes debug=no gui=no mode="ql"
Generating SourceMap for Crab.....!
Generating SourceMap for EGRET DiffuseCaught St13runtime_error at the top level:
time -p gtsrcmaps scfile=orbSim_scData_0000.fits sctable="SC_DATA" expcube=ltcube.fits cmap=countsMap.fits
srcmdl=/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/sane/data/srcModel_egretdiffuse.xml bexpmap=bexpmap.
fits wmap=none outfile=sourceMaps.fits irfs="DC1A" evtype="INDEF" convol=yes resample=yes rfactor=2 minbinsz=0.
1 ptsrc=yes psfcorr=yes emapbnds=no copyall=no chatter=2 clobber=yes debug=no gui=no mode="ql"
Generating SourceMap for Crab.....!
Generating SourceMap for EGRET Diffuse.....!
Generating SourceMap for Geminga.....!
Generating SourceMap for PKS 0528+134.....!
real 244.39
user 238.31
sys 3.86
time -p gtsrcmaps scfile=orbSim_scData_0000.fits sctable="SC_DATA" expcube=ltcube.fits cmap=countsMap.fits
srcmdl=/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/sane/data/srcModel_egretdiffuse.xml
bexpmap=bexpmap_allsky.fits wmap=none outfile=sourceMaps_allsky.fits irfs="DC1A" evtype="INDEF" convol=yes
resample=yes rfactor=2 minbinsz=0.1 ptsrc=yes psfcorr=yes emapbnds=no copyall=no chatter=2 clobber=yes debug=no
gui=no mode="ql"
Generating SourceMap for Crab.....!
Generating SourceMap for EGRET Diffuse.....!
Generating SourceMap for Geminga.....!
Generating SourceMap for PKS 0528+134.....!
real 243.39
user 237.10
sys 4.07
time -p gtlike irfs="DC1A" expcube=ltcube.fits srcmdl=/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/sane
/data/srcModel_egretdiffuse.xml sfile=binned_fit_model.xml check_fit=yes results=results.dat
specfile=counts_spectra.fits statistic="BINNED" optimizer="MINUIT" ftol=0.001 toltype="ABS" tsmine=no save=yes
refit=no evfile=none evtable="EVENTS" scfile=orbSim_scData_0000.fits sctable="SC_DATA" expmap=none plot=no
cmap=sourceMaps.fits bexpmap=bexpmap.fits wmap=none psfcorr=yes phased_expmap=none chatter=2 clobber=yes
debug=no gui=no mode="ql"
*****
**      1 **SET PRINT      .000
*****
*****
**      2 **SET NOWARN
*****

PARAMETER DEFINITIONS:
NO.   NAME      VALUE      STEP SIZE      LIMITS
1 'Integral ' 1.0000      1.0000      .10000E-04 1000.0
2 'Index   ' -2.0000      1.0000      -5.0000     -1.0000
3 'Prefactor ' 11.000      1.0000      .10000E-02 1000.0
4 'Integral ' 1.0000      1.0000      .10000E-04 1000.0
5 'Index   ' -2.0000      1.0000      -5.0000     -1.0000
6 'Integral ' 1.0000      1.0000      .10000E-04 1000.0
7 'Index   ' -2.0000      1.0000      -5.0000     -1.0000
*****
**      3 **SET ERR      .5000
*****
*****

```

```

**      4 **SET GRAD      1.000
*****
*****
**      5 **MINIMIZE      1500.      2.000
*****

MIGRAD MINIMIZATION HAS CONVERGED.

MIGRAD WILL VERIFY CONVERGENCE AND ERROR MATRIX.

FCN=   19816.90      FROM MIGRAD      STATUS=CONVERGED      141 CALLS      142 TOTAL
                        EDM=   .72E-05      STRATEGY= 1      ERR MATRIX NOT POS-DEF

EXT PARAMETER              APPROXIMATE      STEP      FIRST
NO.  NAME      VALUE      ERROR      SIZE      DERIVATIVE
 1  Integral    12.140      1.5834      .29222E-01      -.24924
 2  Index      -2.0836      .54515E-01      .78442E-01      -.10655
 3  Prefactor   11.110      .18083      .60504E-02      -.21283
 4  Integral    11.323      .68077      .19226E-01      -.16073
 5  Index      -1.7040      .23207E-01      .45737E-01      .29923E-01
 6  Integral    11.961      25.038      .43760E-01      -.19713E-02
 7  Index      -2.5709      .96024      .78442E-01      -.33778E-02
                        ERR DEF=   .500

Final values:
Integral = 12.1396
Index    = -2.08361
Prefactor = 11.11
Integral = 11.3231
Index    = -1.70403
Integral = 11.9609
Index    = -2.57088
*****
**      6 **HESSE
*****

FCN=   19816.90      FROM HESSE      STATUS=OK      52 CALLS      194 TOTAL
                        EDM=   .71E-05      STRATEGY= 1      ERROR MATRIX ACCURATE

EXT PARAMETER              INTERNAL      INTERNAL
NO.  NAME      VALUE      ERROR      STEP SIZE      VALUE
 1  Integral    12.140      2.2474      .12918E-03      -1.3500
 2  Index      -2.0836      .77597E-01      .27692E-03      .47596
 3  Prefactor   11.110      .21165      .26737E-04      -1.3596
 4  Integral    11.323      1.1914      .84942E-04      -1.3576
 5  Index      -1.7040      .40413E-01      .20165E-03      2.4367
 6  Integral    11.961      4.7317      .22326E-03      -1.3516
 7  Index      -2.5709      .18859      .49452E-03      .21624
                        ERR DEF=   .500

Minuit fit quality: 3      estimated distance: 7.06209e-06
Minuit parameter uncertainties:
 1  2.24752
 2  0.0776215
 3  0.211654
 4  1.19147
 5  0.0404182
 6  4.73315
 7  0.188886
....!
Computing TS values for each source (4 total)

Photon fluxes are computed for the energy range 100 to 200000 MeV

Crab:
Integral: 12.1396 +/- 2.24752
Index: -2.08361 +/- 0.0776215
LowerLimit: 20
UpperLimit: 200000
TS value: 442.947
Flux: 2.123e-06 +/- 2.00225e-07 photons/cm^2/s

EGRET Diffuse:

```

Prefactor: 11.11 +/- 0.211654
Index: -2.1
Scale: 100
Flux: 0.000456706 +/- 8.69547e-06 photons/cm^2/s

Geminga:
Integral: 11.3231 +/- 1.19147
Index: -1.70403 +/- 0.0404182
LowerLimit: 20
UpperLimit: 200000
TS value: 1624.76
Flux: 3.6356e-06 +/- 5.91005e-07 photons/cm^2/s

PKS 0528+134:
Integral: 11.9609 +/- 4.73315
Index: -2.57088 +/- 0.188886
LowerLimit: 20
UpperLimit: 200000
TS value: 95.2913
Flux: 9.55637e-07 +/- 1.54084e-07 photons/cm^2/s
WARNING: Fit may be bad in range [213.847, 275.51] (MeV)
WARNING: Fit may be bad in range [977.933, 1259.92] (MeV)

Total number of observed counts: 3991
Total number of model events: 3990.93

-log(Likelihood): 19816.90052

Writing fitted model to binned_fit_model.xml
Elapsed CPU time: 8.23
real 9.25
user 8.11
sys 0.31

time -p gtlike irfs="DC1A" expcube=ltcube.fits srcmdl=/nfs/farm/g/glast/u52/rhel7-test/ScienceTools-scons/sane
/data/srcModel_egretdiffuse.xml sfile=binned_fit_model.xml check_fit=yes results=results.dat
specfile=counts_spectra.fits statistic="BINNED" optimizer="MINUIT" ftol=0.001 toltype="ABS" tsmin=no save=yes
refit=no evfile=none evtable="EVENTS" scfile=orbSim_scData_0000.fits sctable="SC_DATA" expmap=none plot=no
cmap=sourceMaps_allsky.fits bexpmap=bexpmap_allsky.fits wmap=none psfcorr=yes phased_expmap=none chatter=2
clobber=yes debug=no gui=no mode="ql"

```
*****
**      1 **SET PRINT      .000
*****
*****
**      2 **SET NOWARN
*****
```

PARAMETER DEFINITIONS:

NO.	NAME	VALUE	STEP SIZE	LIMITS
1	'Integral'	1.0000	1.0000	.10000E-04 1000.0
2	'Index'	-2.0000	1.0000	-5.0000 -1.0000
3	'Prefactor'	11.000	1.0000	.10000E-02 1000.0
4	'Integral'	1.0000	1.0000	.10000E-04 1000.0
5	'Index'	-2.0000	1.0000	-5.0000 -1.0000
6	'Integral'	1.0000	1.0000	.10000E-04 1000.0
7	'Index'	-2.0000	1.0000	-5.0000 -1.0000

```
*****
**      3 **SET ERR      .5000
*****
*****
**      4 **SET GRAD      1.000
*****
*****
**      5 **MINIMIZE      1500.      2.000
*****
```

MIGRAD MINIMIZATION HAS CONVERGED.

MIGRAD WILL VERIFY CONVERGENCE AND ERROR MATRIX.

FCN= 19812.67 FROM MIGRAD STATUS=CONVERGED 142 CALLS 143 TOTAL

EDM= .84E-04 STRATEGY= 1 ERR MATRIX NOT POS-DEF

EXT	PARAMETER		APPROXIMATE	STEP	FIRST
NO.	NAME	VALUE	ERROR	SIZE	DERIVATIVE
1	Integral	12.235	1.5922	.29247E-01	-.33081
2	Index	-2.0853	.54441E-01	.78442E-01	-.11353
3	Prefactor	10.991	.17898	.60191E-02	1.6623
4	Integral	11.369	.68301	.19237E-01	.71522
5	Index	-1.7048	.23199E-01	.45669E-01	-.43278
6	Integral	11.805	24.699	.43760E-01	-.17697E-01
7	Index	-2.5641	.95870	.78442E-01	.37065E-02

ERR DEF= .500

Final values:

Integral = 12.2349
Index = -2.08531
Prefactor = 10.9909
Integral = 11.3693
Index = -1.7048
Integral = 11.8053
Index = -2.56408

** 6 **HESSE

FCN= 19812.67 FROM HESSE STATUS=OK 52 CALLS 195 TOTAL
EDM= .69E-04 STRATEGY= 1 ERROR MATRIX ACCURATE

EXT	PARAMETER		INTERNAL	INTERNAL
NO.	NAME	VALUE	STEP SIZE	VALUE
1	Integral	12.235	.12929E-03	-1.3491
2	Index	-2.0853	.27620E-03	.47501
3	Prefactor	10.991	.26599E-04	-1.3607
4	Integral	11.369	.84991E-04	-1.3571
5	Index	-1.7048	.20135E-03	2.4372
6	Integral	11.805	.22157E-03	-1.3531
7	Index	-2.5641	.49393E-03	.21972

ERR DEF= .500

Minuit fit quality: 3 estimated distance: 6.90909e-05

Minuit parameter uncertainties:

1 2.25938
2 0.0775027
3 0.20944
4 1.19537
5 0.040403
6 4.64629
7 0.187673

....!

Computing TS values for each source (4 total)

Photon fluxes are computed for the energy range 100 to 200000 MeV

Crab:

Integral: 12.2349 +/- 2.25938

Index: -2.08531 +/- 0.0775027

LowerLimit: 20

UpperLimit: 200000

TS value: 446.097

Flux: 2.13383e-06 +/- 2.00566e-07 photons/cm^2/s

EGRET Diffuse:

Prefactor: 10.9909 +/- 0.20944

Index: -2.1

Scale: 100

Flux: 0.000451808 +/- 8.60452e-06 photons/cm^2/s

Geminga:

Integral: 11.3693 +/- 1.19537

Index: -1.7048 +/- 0.040403

LowerLimit: 20

UpperLimit: 200000

TS value: 1629.22

Flux: 3.646e-06 +/- 5.92359e-07 photons/cm^2/s

PKS 0528+134:

Integral: 11.8053 +/- 4.64629

Index: -2.56408 +/- 0.187673

LowerLimit: 20

UpperLimit: 200000

TS value: 95.787

Flux: 9.53561e-07 +/- 1.53515e-07 photons/cm^2/s

WARNING: Fit may be bad in range [213.847, 275.51] (MeV)

WARNING: Fit may be bad in range [977.933, 1259.92] (MeV)

Total number of observed counts: 3991

Total number of model events: 3991.21

-log(Likelihood): 19812.66808

Writing fitted model to binned_fit_model.xml

Elapsed CPU time: 8.51

real 9.55

user 8.40

sys 0.30

time -p gtmodel srcmaps=sourceMaps_allsky.fits srcmdl=binned_fit_model.xml outfile=model_map.fits irfs="DC1A" evtype="INDEF" expcube=ltcube.fits bexpmap=bexpmap_allsky.fits convol=yes resample=yes rfactor=2 outtype="CMAP" psfcorr=yes edisp=no chatter=2 clobber=yes debug=no gui=no mode="ql"

real 17.07

user 8.67

sys 5.95

time -p gtmodel srcmaps=sourceMaps_allsky.fits srcmdl=binned_fit_model.xml outfile=model_cube.fits irfs="DC1A" evtype="INDEF" expcube=ltcube.fits bexpmap=bexpmap_allsky.fits convol=yes resample=yes rfactor=2 outtype="CCUBE" psfcorr=yes edisp=no chatter=2 clobber=yes debug=no gui=no mode="ql"

real 14.80

user 8.83

sys 4.02

time -p gtobssim infile=xmlFiles.txt srclist=source_names.txt scfile=none sctable="SC_DATA" evroot="Crab" evtable="EVENTS" simtime=86400.0 ltfrac=0.9 tstart="INDEF" nevents=no maxtime=315500000.0 startdate="2001-01-01 00:00:00" offset=0 rockangle="INDEF" use_ac=no ra=0.0 dec=0.0 radius=20.0 emin=1.0 emax=1000000.0 edisp=yes irfs="DC1A" evtype="none" area=1.0 maxrows=1000000 seed=62587 chatter=2 clobber=yes debug=no gui=no mode="ql" added source "_3EG_J0534p2200-32mev"

Generating events for a simulation time of 86400 seconds....

Done.

real 1.53

user 0.66

sys 0.06

time -p gtselect infile=Crab_events_0000.fits outfile=Crab_events_filtered.fits ra=83.57 dec=22.01 rad=20.0 tmin=0.0 tmax=0.0 emin=30.0 emax=300000.0 zmin=0.0 zmax=180.0 evclass="INDEF" evtype="INDEF" convtype=-1 phasemin=0.0 phasemax=1.0 evtable="EVENTS" chatter=2 clobber=yes debug=no gui=no mode="ql"

Done.

real 0.91

user 0.15

sys 0.04

time -p gtbin evfile=Crab_events_filtered.fits scfile=Crab_scData_0000.fits outfile=Crab.fits algorithm="CMAP" ebinalg="LOG" emin=30.0 emax=200000.0 enumbins=20 denenergy=0.0 ebinfile=NONE tbinalg="LIN" tstart=0.0 tstop=86400.0 dtim=1000.0 tbinfile=numxpix=100 snratio=1.0 lcemin=0.0 lcemax=0.0 nxpix=100 nypix=100 binsz=0.5 coordsys="CEL" xref=83.0 yref=22.0 axisrot=0.0 rafiield="RA" decfield="DEC" proj="CAR" hpx_ordering_scheme="RING" hpx_order=3 hpx_ebin=yes hpx_region="" evtable="EVENTS" sctable="SC_DATA" efield="ENERGY" tfield="TIME" chatter=2 clobber=yes debug=no gui=no mode="ql"

This is gtbin version ScienceTools-11-03-00

real 1.19

user 0.20

sys 0.04

time -p gtbin evfile=Crab_events_filtered.fits scfile=Crab_scData_0000.fits outfile=Crab.pha algorithm="PHA1" ebinalg="LOG" emin=30.0 emax=200000.0 enumbins=20 denenergy=0.0 ebinfile=NONE tbinalg="LIN" tstart=0.0 tstop=86400.0 dtim=1000.0 tbinfile=numxpix=100 snratio=1.0 lcemin=0.0 lcemax=0.0 nxpix=100 nypix=100 binsz=0.5 coordsys="CEL" xref=83.0 yref=22.0 axisrot=0.0 rafiield="RA" decfield="DEC" proj="CAR" hpx_ordering_scheme="RING" hpx_order=3 hpx_ebin=yes hpx_region="" evtable="EVENTS" sctable="SC_DATA" efield="ENERGY" tfield="TIME" chatter=2 clobber=yes debug=no gui=no mode="ql"

This is gtbin version ScienceTools-11-03-00

real 1.01

user 0.19

```
sys 0.03
time -p gtbin evfile=Crab_events_filtered.fits scfile=Crab_scData_0000.fits outfile=Crab.lc algorithm="LC"
ebinalg="LOG" emin=30.0 emax=200000.0 enumbins=20 denenergy=0.0 ebinfile=NONE tbinalg="LIN" tstart=0.0
tstop=86400.0 dtime=1000.0 tbinfile=numxpix=100 snratio=1.0 lcemin=0.0 lcemax=0.0 nxpix=100 nypix=100 binsz=0.5
coordsys="CEL" xref=83.0 yref=22.0 axisrot=0.0 rafiold="RA" decfiold="DEC" proj="CAR" hpx_ordering_scheme="
RING" hpx_order=3 hpx_ebin=yes hpx_region="" evtbale="EVENTS" sctable="SC_DATA" efiold="ENERGY" tfiold="TIME"
chatter=2 clobber=yes debug=no gui=no mode="ql"
This is gtbin version ScienceTools-11-03-00
real 0.98
user 0.18
sys 0.04
time -p gtrspgen respalg="PS" specfile=Crab.pha scfile=Crab_scData_0000.fits outfile=Crab.rsp irfs="DC1AF"
sctable="SC_DATA" resptpl=DEFAULT chatter=2 clobber=yes debug=no gui=no mode="ql" time=1000.0 thetacut=70.0
dcostheta=0.025 phinumbins=1 ebinalg="LOG" efiold="ENERGY" emin=30.0 emax=200000.0 enumbins=20 denenergy=0.0
ebinfile=NONE
This is gtrspgen version ScienceTools-11-03-00
real 1.29
user 0.27
sys 0.05
```