

IRFs Handling in ScienceTools

Proposed behavior

- Users will specify cuts in gtselect by giving the IRF name, e.g., P7REP_SOURCE_V15, instead of giving evclass:

```
gtselect irfs=P7REP_SOURCE_V15
```

- The bit mask to apply for this choice of irfs is found from CALDB/data/glast/lat/bcf/irfs_index.fits
- The irfs choice is written to the EVENTS header of the FT1 file written by gtselect as DSS keywords:

```
DSTYP3: IRF_VERSION  
DSUNI3: DIMENSIONLESS  
DSVAL3: P7REP_SOURCE_V15
```

Writing this information as DSS keywords ensures that it will be propagated to downstream data products such as counts maps, gtdiffrrsp output files, etc..

- For all downstream tools, irfs(=INDEF) is a hidden parameter. If unspecified, then the tools will determine the irfs to use from the DSS keywords of the input files.
- The user can override the irfs for any tool by specifying the irfs option at the command line:

```
gtdiffrrsp irfs=P7REP_SOURCE_V10
```

If this choice differs from the one given in the DSS keywords of the input files, then a warning is issued.

- These changes are in ScienceTools-LATEST-1-3965 (the current LATEST). The only par file that has been changed is gtselect.par in which irfs=INDEF is added as a hidden parameter. In order to enable these changes fully, we need only make irfs(=INDEF) a hidden parameter in all downstream tools and make irfs a required parameter in gtselect. The current LATEST should be compatible with existing scripts.

To Be Resolved

- How should the irfs be determined initially in gtselect?
 - User supplies full irfs name, e.g., irfs=P7REP_SOURCE_V15. The bit mask is found by look up in irfs_index.fits.
 - User supplies bit mask, e.g., evclass=2, and the most recent set of irfs are inferred from caldb.indx and irfs_index.fits.
 - User is not required to give anything, and the most recent "source" class irfs and event selection is used.