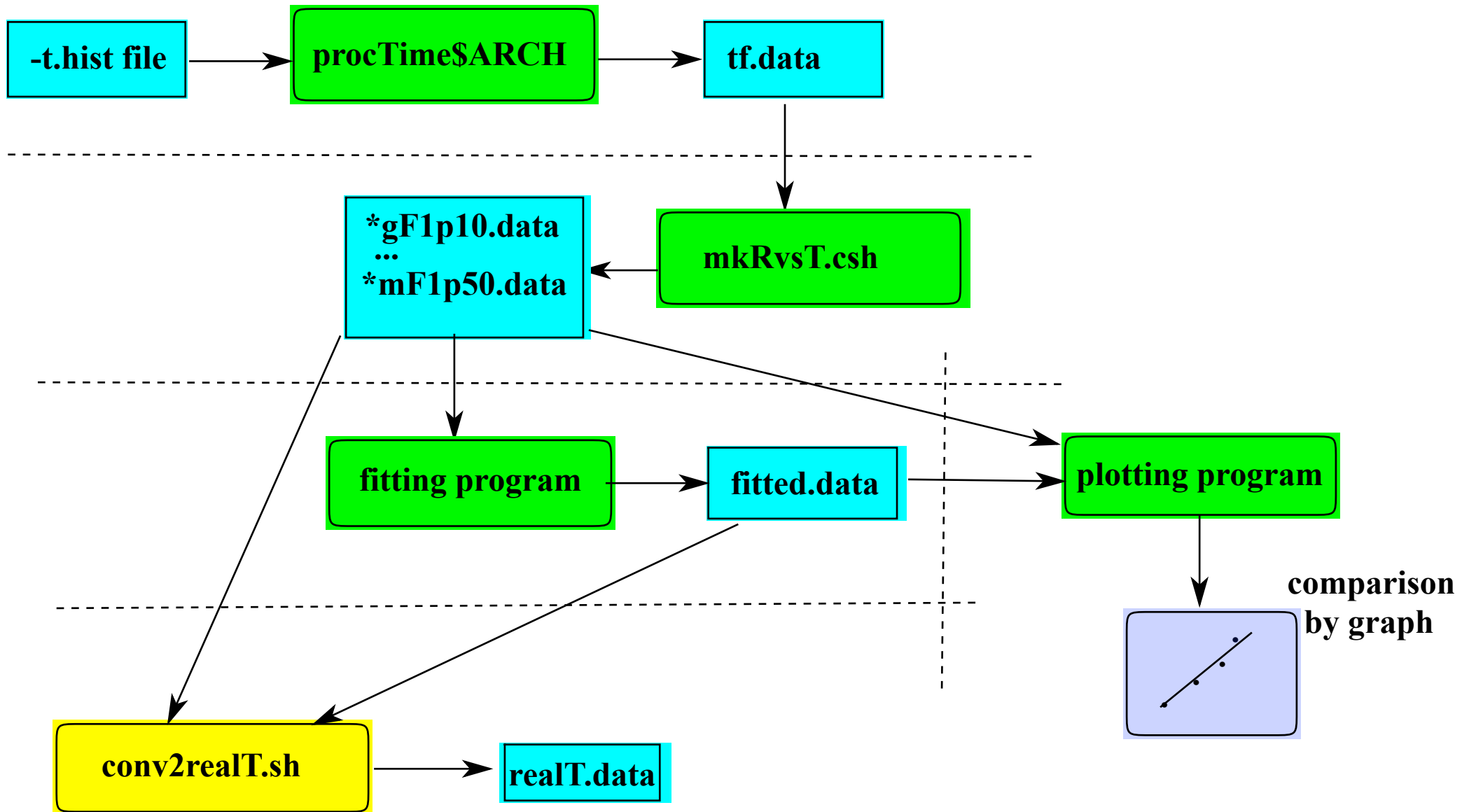


# Step by step processing of -t.hist data (manul handling)



If input data has reduced time, this can convert the time into actual time.

**procTime\$ARCH**

Example

input **-t.hist** file

```
./procTimePCLinuxIFC 1 0 11 0 100 ~/CosmosData/NewLDD/p1x20eV/  
cos0.850/T1e-6-1e5/p1x20cos0.850T1e-6 1e5-tasim529 32418 090119184724-  
t.hist > tf.data
```

1: **-t.hist** is ascii. 2: **-t.hist** is binary

100: max number of smoothing when getting T10% etc. For LDD 100~500 may be ok. For FDD 3 is normally enough

0: time in **-t.hist** is non-reduced time. 1: reduced time

11: maximum of 11 time fractions are available. How many of such one do you want to use. 1: T5%, 2:T5,T10%, 3:T5,T10, T20....10:T5,..T90 11: T5,T10...T90,T95%. In acutal time fitting T10 is OK (i.e, 2).

0: **-t.hist** is made by mkLDD. 1: from FDD data base

for details; hit **./procTime\$ARCH**

**tf.data**

fai index: 10 is 270-15 to 270+15 deg

particle code. 1: g 2: e 3: m 4: h

layer index: at present always 1

10 1 1

1	-3.072E-01	-2.595E-01	-1.471E-01	-4.633E-02	1.085E-01	1.802E-01	...
2	-3.994E-01	-3.320E-01	-1.958E-01	-8.140E-02	4.473E-02	1.940E-01	...
3	-4.829E-01	-3.827E-01	-2.448E-01	-1.110E-01	1.332E-02	6.839E-02	...
4	-5.814E-01	-5.245E-01	-3.484E-01	-2.168E-01	-1.145E-01	6.866E-02	
...							
...							
...							
38	2.188E+03	3.039E+03	3.519E+03	4.639E+03	5.103E+03	6.167E+03	..
39	6.972E+03	7.330E+03	7.523E+03	7.680E+03	8.127E+03	9.751E+03	..

0 0 0 0 0 0 0 0 0 0 0 0

end of this series

11 1 1

next fai

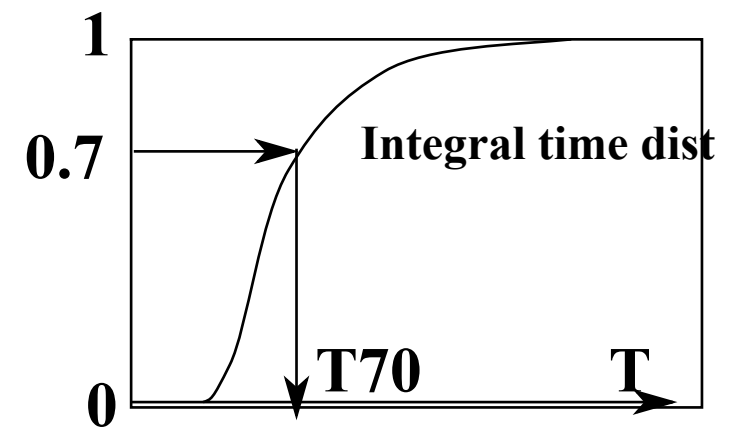
T5%

T10%

T20%

r index. 1: 0.01 mu.  $10^{0.1}$  step

**NOTE:** max index is 42. If no data or difficult to get values, <42



mkRvsT.csh

for details; hit `./mkRvsT.csh`

`./mkRvsT.csh` **86 86 0.85** tf.data **Work/LDDtest**

sam Moliere unit (m) at TA site

cosine of primary zenith angle. **IMPORTANT:**

**If 1.0**, give 1.0 always

else if -t.hist has **reduced time**, give **negative value**

else **true cosine value**.

directory/basefilename

Many files will be created in the directory.

E.g in Work

Each file contains a number of (r,T) pairs

ptcl symbol. g,e,m,h

fai region index 1: -15 to 15 deg

T10, T20 etc. percentage.

LDDtesteF1p10.data  
LDDtesteF1p50.data  
LDDtesteF4p10.data  
LDDtesteF4p50.data  
LDDtesteF4p90.data  
LDDtesteF7p10.data  
....

**mkRvsT.csh**

**Tips:** You can control files to be produced by changing the content of **mkRvsTcond.csh**

**set codeA=(1 2 3 4)**  
**set codeN=(g e m h)**

**set faiA=(1 4 7)**  
**set faiV=(0 90 180)**

**set percentA=(3 7 11)**  
**set percentV=(10 50 90)**

ptcl code to be treated. 1st line: number  
2nd line: corresponding symbol

fai index and corresponding value  
in degree

specifies fraction index and percentage, i.e., T10 etc.  
T5 is the first one but as an index, you have to specify 2. (i.e. **+1** is needed; see tf.data format)

**set codeA=(1 3)**  
**set codeN=(g m)**  
is a valid exapmle

fitting program

fitting program

1) `/TAMCDB/F/src/Minuit/Util/timeFit/timeFitPCLinuxIFC 1 < Work/  
LDDtestgF1p10.data > fitted.data`

gamma, Fai index 1, T10%      number of (r, T)'s  
by fitted formula      ptcl code. 1: g  
At present, 1-4 gives  
no difference

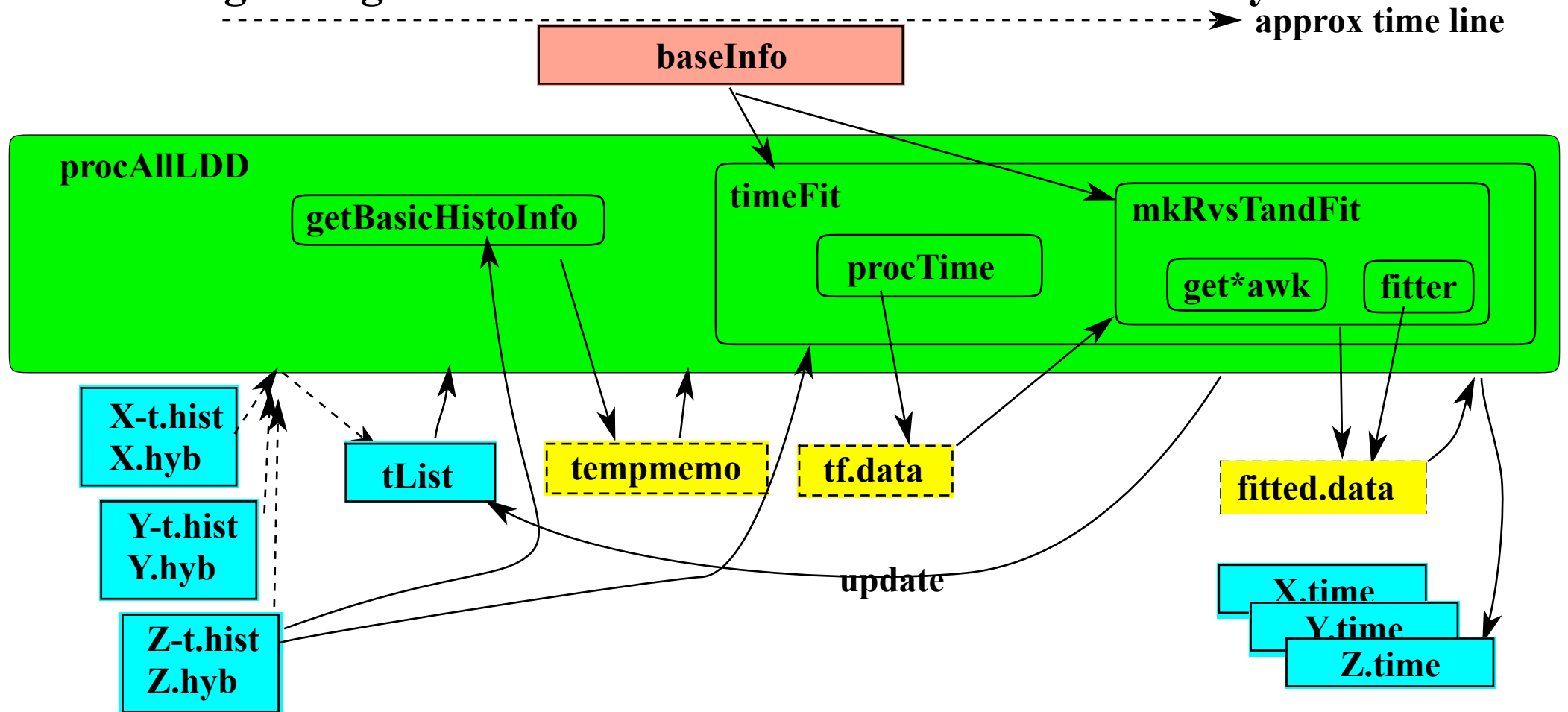
2) `/TAMCDB/F/src/Minuit/Util/timeFit/timeFitPCLinuxIFC 1 c <  
Work/LDDtestgF1p10.data > coeff.data`

If **c** is put, only coefficients will be put into stdout.  
If **c** is omitted (first example), coefficients will be  
put into stderr.

$$T = ar^{b+c \log(r)}$$

for details; hit the command

# Getting fitting coefficients for all -t.hist files automatically



- 0) **baseInfo**: where is fitter. how many smoothing, reduced time ? etc
- 1) **tList**: contains X,Y,Z.... If not exist, created by **procAllLDD**
- 2) **tmpmemo**: **getBasicHistoInfo** gets layer, cosz etc and put them here
- 3) **tf.data**: time fraction data (time at 5,10,20,...95 %) for r, fai, code
- 4) **fitted.data**: coefficients to fit  $(r, T_{10})$  as  $T_{10} = a * r^{(b + c \log(r))}$ ; finally renamed to **X.time** etc.
- 5) **tList** is updated to contain = before X etc (say, = X) to indicate the X has been already processed.

**procAllLDD.sh**

Before using this command, you have to establish the content of the baseInfo file.

baseInfo

fitter /TAMCDB/F/src/Minuit/Util/timeFit/timeFit (r,t) fitting routine  
# \$ARCH is automatically added after the exec programname  
smooth 100 max smoothing number for LDD integral time hist(500 may be ok)  
reducedT no give yes-->reduced time is used in -t.hist.  
maxage 2. if age> maxage, we skip getting coef. for that shower.  
# 2 means no skip. 0.9 may be good for quick job.

For example, **timeFitPCLinuxIFC**, will be the actual fitting program.



**procAllLDD.sh**

`./procAllLDD.sh` `~/CosmosData/NewLDD/p1x20eV/cos0.850/T1e-6-1e5`  
`~/CosmosData/NewLDD/p1x20eV/cos0.850/T1e-6-1e5`

Output directory: in this example the same as input directory.  
All **\*.time** and **tList** will be placed here.

**.time** file content

			el
1 30 1 1			layer #
155.0	1.063	0.1169E-01	a b c for r<1.5
151.4	1.109	-0.3564E-02	a b c for r>1.5
1 30 1 2			fai index
151.2	1.071	0.1214E-01	
151.9	1.079	0.4202E-02	
...			
1 30 4 12			ptcl code 4:h
197.9	1.296	0.5582E-01	
213.0	1.200	0.1794E-01	
1 0 0 0			end of table

Directory where input files reside:  
-t.hist and .hyb files must be there

**tList** content  
= p1x20cos0.850T...48-t.hist  
= p1x20cos0.850T...00-t.hist  
...

= at the top implies the file has been already processed. If there are some files without =, you can continue `procAllLDD.sh` to process such files.

`1>out 2>err &` for backgroun job