Current Status of LAr HEC+EMEC TestBeam software

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Release Information

Athena Release	**6.0.2**
CMT version	**v1r12p20020606**
OS and compiler	**rh73 and gcc2.95 with debug and opt**

What is available in 6.0.2

- **Bug fix on Beam Chamber data** (LArHECTBCnv).
- **New alignment file is prepared for 2002 TestBeam.**

The above work were done by Sven.

They are available since 6.0.0.

Next Release 6.0.3 (final branch)

Deadline of tag collector is Apr 15th.

Commit your update prior to Apr 11th 12:00 (CEST).

Also refer

http://particle.phys.uvic.ca/~nkanaya/athena_tb/doc/release.html

Current status and Plans

Software must be updated for several reasons:

Software update and bug fixes

- **Eta, phi and layer indices problem in** LArTBStandardNtup (LArHECTBAna)
  → **committed in Apr 3rd and available from 6.0.3**
- **Beam trajectory reconstruction**

  It does not work for muon data, which was reported by Leonid and Mikhail.
  → **Under investigation**
- **NAN/inf problem in digital filtering method.**
  Mainly LArDigitalFiltering and LArTBSignal (LArHECTBAna)
  → **committed Apr 1st by Sven and available from 6.0.3**
- **New ntuple structure for 2002** LArTBCombinedNtup (LArHECTBAna)
  → **committed Apr 3rd and available from 6.0.3**

For migration to gcc3.2

- **Some changes are required to move to gcc3.2**
  → **Must be done before 6.1.0**

Current status and Plans (con'd)

For non-HEC/EMEC people

Several people tried our software as an example toward the 2004 combined TestBeam, and sometimes felt it difficult to use.

- **Update jobOptions files for default usage and hide some special properties.**
- **Web document is being updated.**

For reconstruction

Once we have signal in MeV, we can use ATLAS default cluster finding algorithm.

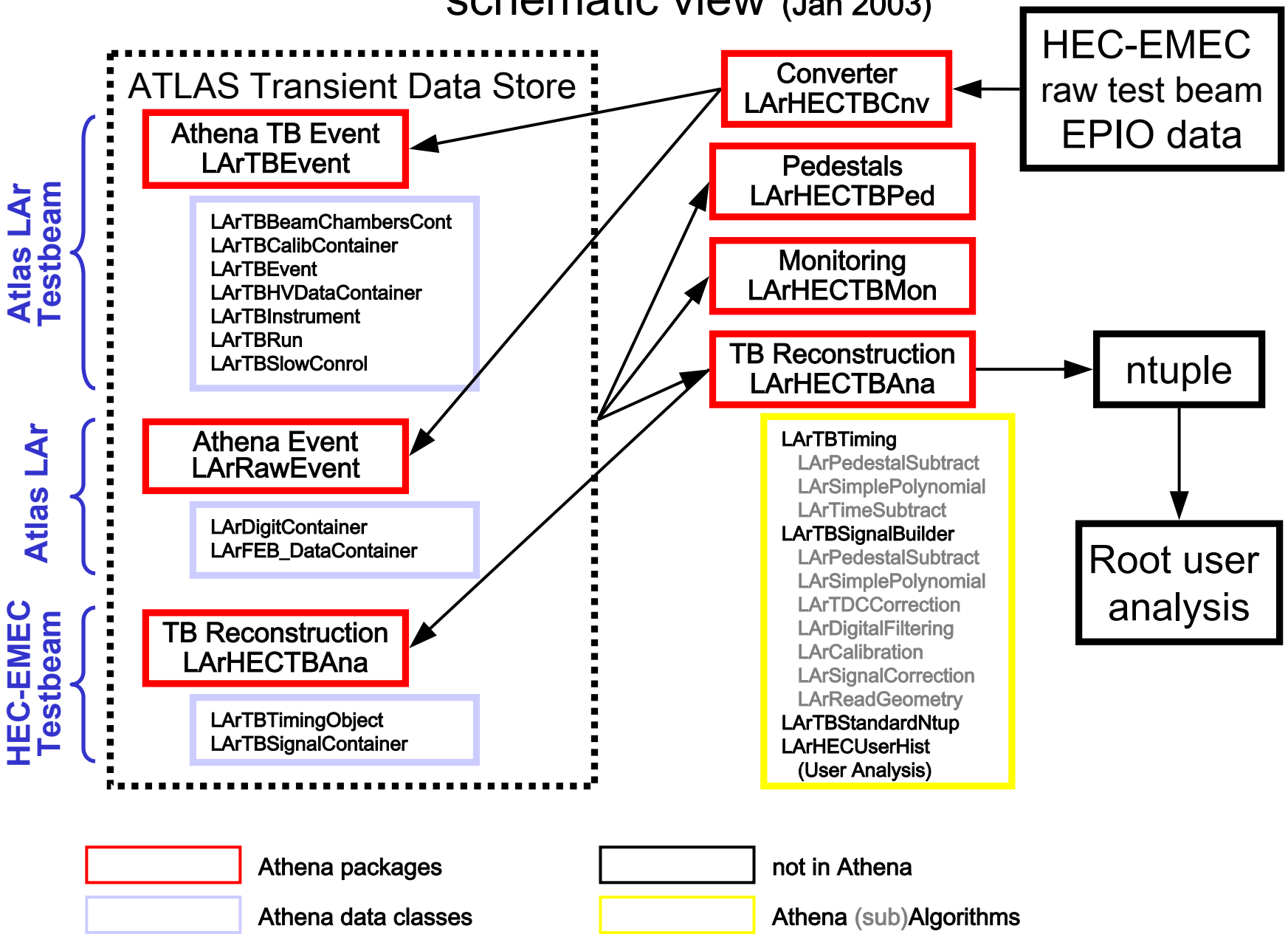
- **Create a** LArHECTBAna **subAlgorithm which produces** LArRawChannel **(signal in MeV).**
- **Implementation of Conditions DB (see next page)**

Others

- **Remove a lot of warnings at compiling (in LArTBEvent)**
  → **Will be done before 6.0.3**

HEC-EMEC Test Beam Software

schematic view (Jan 2003)



Conditions Database

Table Structure and Software

- **When release 6.0.3 is completed,** LArConditions **and** LArElecCalib **are updated for our time dependent data for release 6.1.0 (ASCII database is also available).**
- **All tables will be ready before 6.1.0.**
- **We cannot store pedestal data for unconnected channels for now.**
- **You can see the database** atlas_tb_hec **at the host** db1.usatlas.bnl.gov.

Time Interval of Validity

IOVDbSvc, which gives a corresponding table according to run number (plus event number) and tag, is not fully usable.
Hong and I have tried it and he raised some issues to the developers.

Open question :
When should we implement the use of the database into LArHECTBAna?

Conditions Database Fields

Table description

- Channel dependent data is fetched via Atlas identifier, Identifier class, which is made of indices:

  detector , region , sampling , eta , phi

  for HEC and EMEC.

- Basic Fields

Field	Type	Null	Key	Default	Extra
id	mediumint(9)		PRI	NULL	auto_increment
trun	timestamp(14)	YES		NULL	
tmod	timestamp(14)	YES		NULL	
gain	int(11)			0	
detector	int(11)			0	
layer	int(11)			0	
region	int(11)			0	
eta	int(11)			0	
phi	int(11)			0	

Conditions Database Fields (con'd)

Fields contents

(1) Pedestal and rms (separated)

Field	Type	Null	Default
nsamp	int(11)		0
p1	float(10,4)		0
. . .			
p<nsamp>	float(10,4)		0

Only one pedestal for our case.

(2) Calibration coefficients

Field	Type	Null	Default
npara	int(11)		0
p1	float		0
. . .			
p<npara-1>	float		0
status	int(11)		0

(3) Digital filtering weight parameters

Field	Type	Null	Default
tbin	float(10,2)		0.00
name	char(4)		
n_samp	int(11)		0
p1	float	YES	NULL
.....			
p<n_samp>	float	YES	NULL

name might be "amp" or "tim".

Global data is given by a header table.

Conditions Database Fields (con'd)

(4) Δt of cubic peak

Field	Type	Null	Default
npar	int(11)		0
global_time	float(10,4)		0
time	float(10,4)		0
error	float(10,4)		0

(5) Δt of digital filtering synchronization.

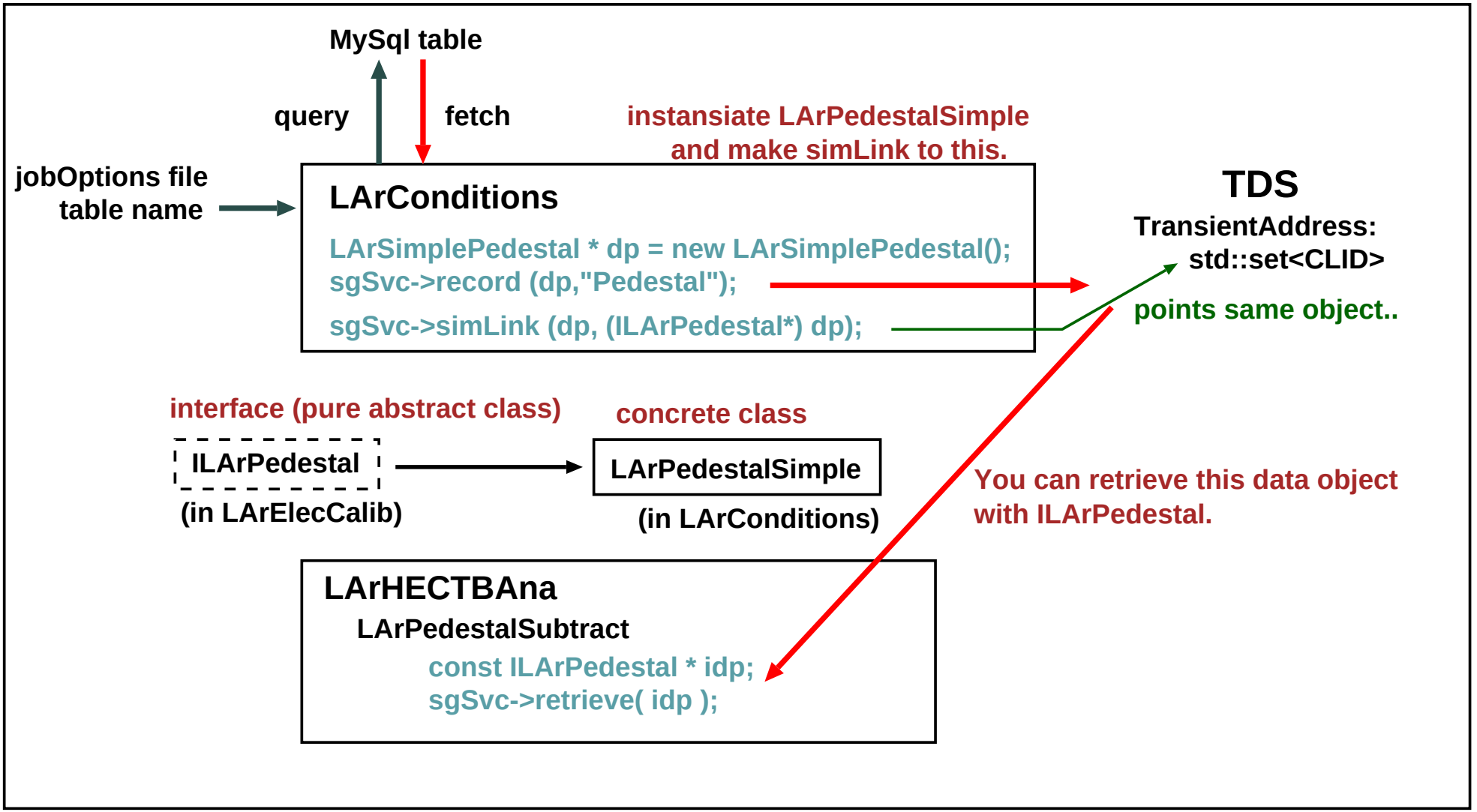
Field	Type	Null	Default
npar	int(11)		0
global_time	float(10,4)		0
time	float(10,4)		0
error	float(10,4)		0

The rest of work...

- No interface/tables for WAC parameters.
- No database for noise data.

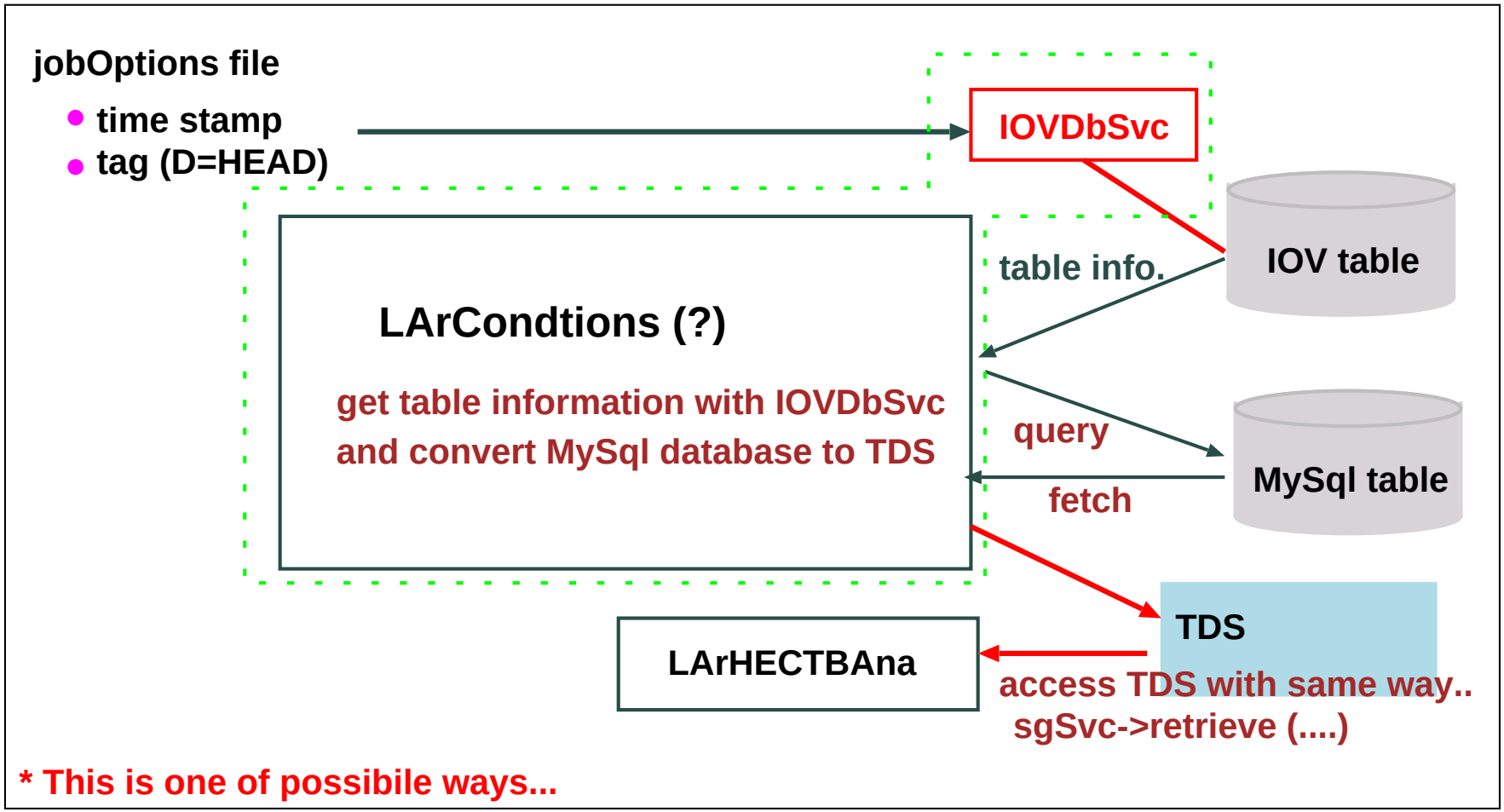
LAr Conditions Database

Current LArConditions package cannot handle time interval of validity..



IOVDbSvc (Interval Of Validity)

One can obtain the desirable table reference from IOVDbSvc and IOV tables (using ConditionsDBMySQL).



You can find these packages under offline/Database.

Summary

- LArHECTBAna (offline analysis) and LArHECTBCnv (data converter) are being updated
- This software is an example for the 2004 combined TestBeam
  - Comments in the code and in the jobOptions files could be improved…
- TestBeam data should be used for reconstruction studies.
  - Need to implement the code to interface with the ATLAS cluster algorithms.
  - Need to implement the use of conditions database
- LArConditions will be updated for the HEC-EMEC time-dependent data for 6.1.0, but without the service to handle time interval of validity
  - Do we want to use the database without IOVDbSvc?