

Status Report of LArHEC OO activities

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Moving to Athena framework

ATLAS common framework

GAUDI architecture + ATLAS-specific algorithms

- For HEC/EMEC combined Testbeam (2001 Summer).
 - ‡ hec_adc framework is useful, but ...
it's ONLY for HEC and written in FORTRAN.
 - ‡ EMEC Testbeam data can be accessed in Athena.
- Testbeam data is very useful for LAr OO code development.

It's a time to move to Athena...

Steps to Athena

- Write concrete algorithm derived from *base class Algorithm*. → done by R.Sobie
- Make *EPIO Fortran functions* usable in C++.
- Write code for EPIO converter.
- Plug *time samples* into a data object (LArDigit).

Read EPIO data

EPIO (Experimental Physics Input Output) Package is a part of *packlib*.

EPIO function prototypes are defined in Fortran subroutines, and they have to have “C” linkage to be called in C++.

in Fortran

epinit.F

```
SUBROUTINE EPINI
```

in C++

EPIO.h

```
extern "C" {  
    void epini_();  
}  
  
inline void epini { epinit_(); };
```

↑ This wrapper is to use a same function name in C++.

Main.cxx

```
#include "EPIO.h"  
int main()  
{  
    epini();  
    return 0;  
}
```

Read/Unpack EPIO data in Athena

- **EPIO.h**

```
class EPIO {  
    public:  
    void open(const char* name);  
    void read();  
    void unpack();  
}
```

- **Unpack.h**

```
class Exp00 {  
    public:  
    virtual void unpack_adc(short *p) = 0;  
};  
class Exp13 : public Exp00  
    public:  
    void unpack_adc(short *p);  
};  
class Exp12 : public Exp00 .....  
void Exp13::unpack_adc(short *p){...};  
void Exp12::unpack_adc(short *p){...};
```

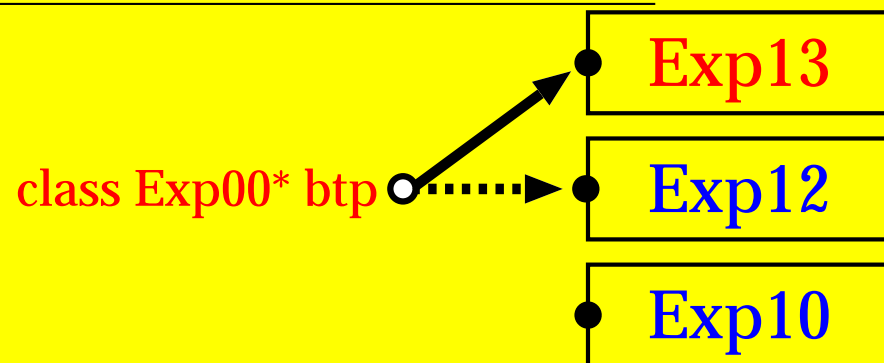
EPIO bank structure may be altered.

```
void EPIO::unpack() {  
    btp->unpack_adc(short *p);  
}
```

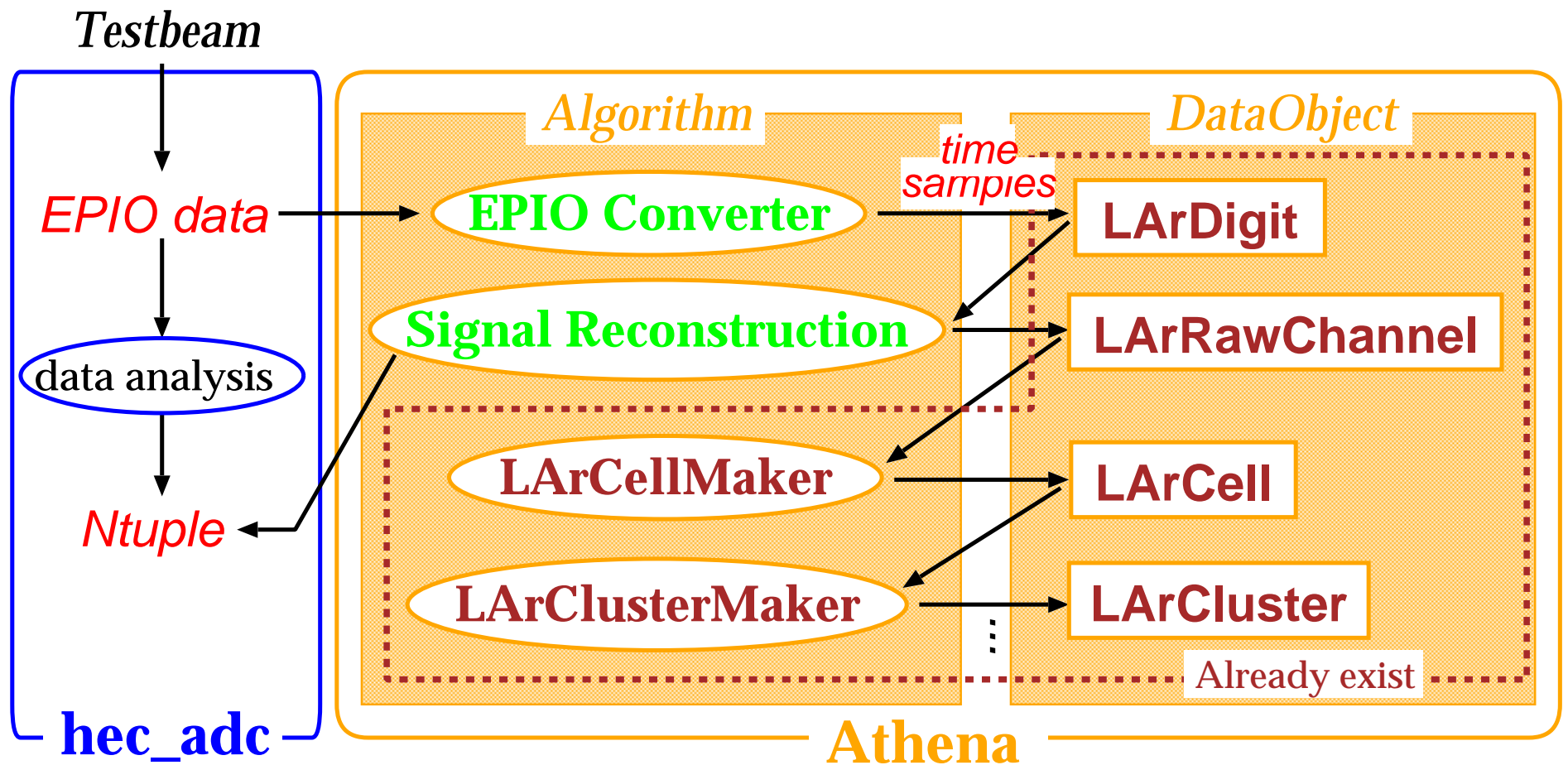
Unpacking method is defined at run time.

- **TestBeam.h**

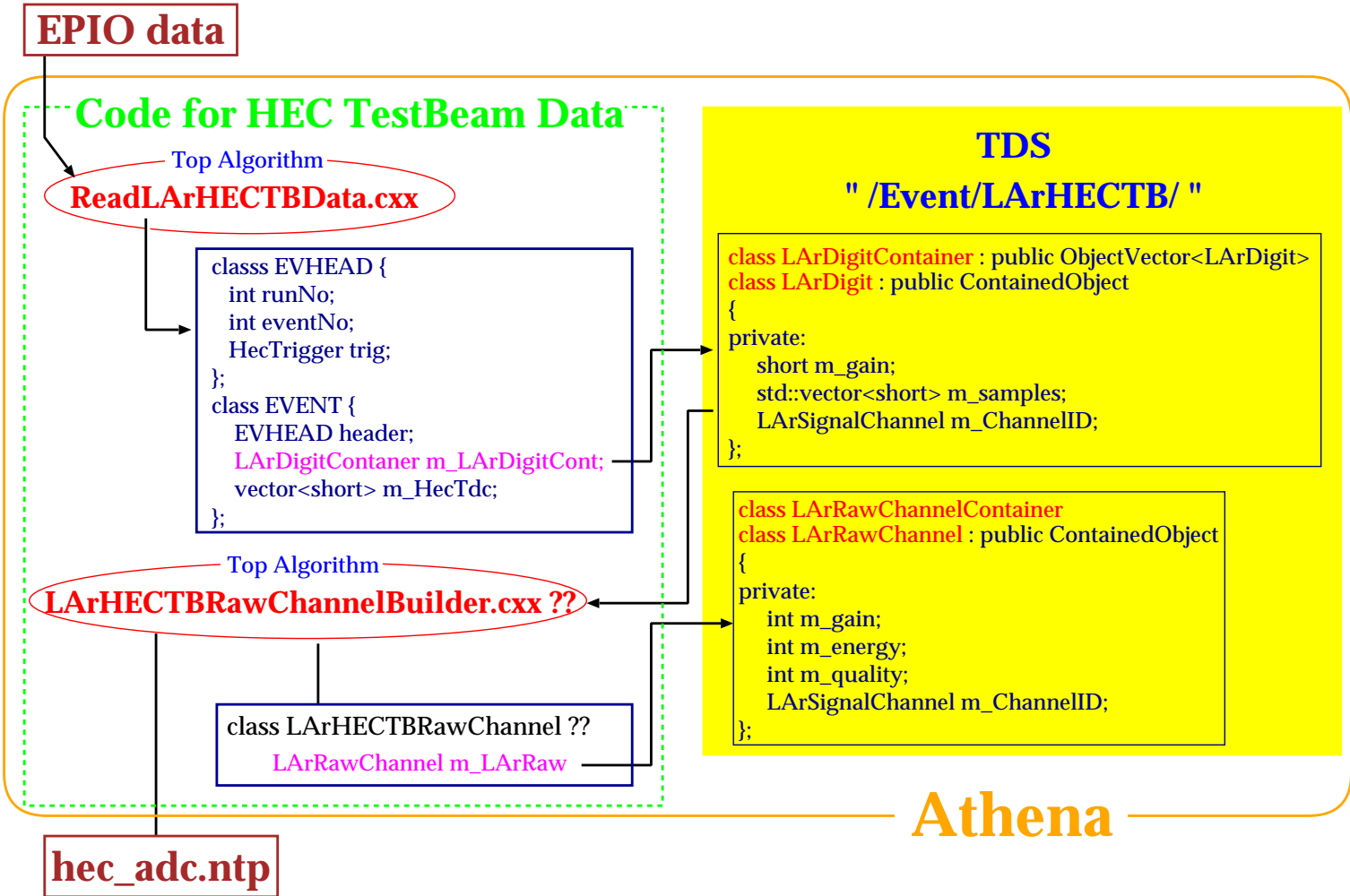
```
void BTclass::set(int RunNo)
```



EPIO converter in Athena



New Algorithm for HEC Testbeam data



Summary

Current Status

- Use Athena release 1.3.7.
- Access TDS via SmartDataPtr.
- Include input data via LArBookkeeping Service.
- ADC time samples are filled into LArDigit.

Outlook

- From SmartDataPtr to StoreGate.
- Signal Reconstruction (LArRawChannel class).