

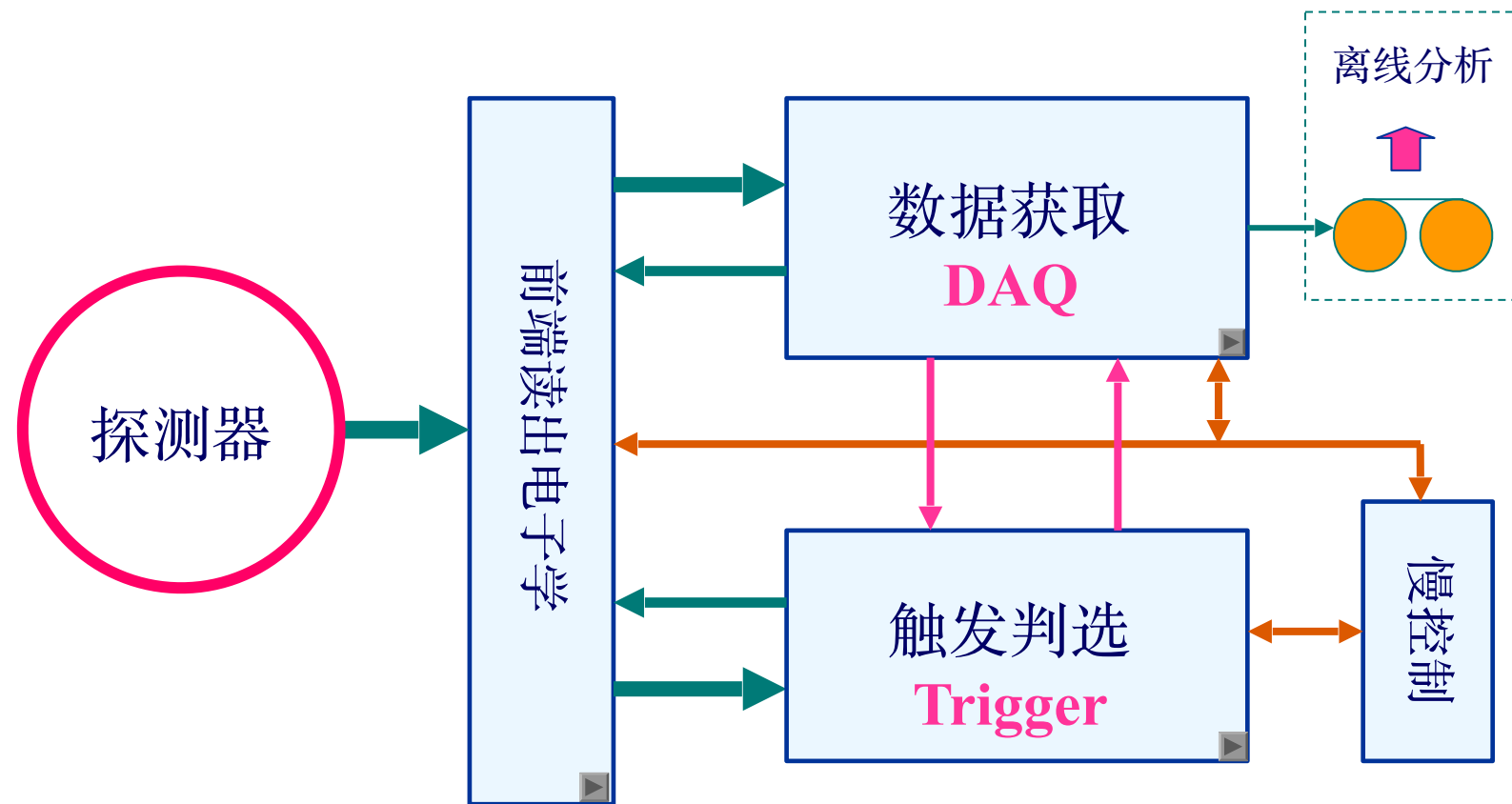
# Electronics System

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# Basic constitution

- Front-End readout electronics
- Trigger system
- Data Acquisition System (DAQ)
- Slow Control

# Basic constitution



# Front-End readout electronics

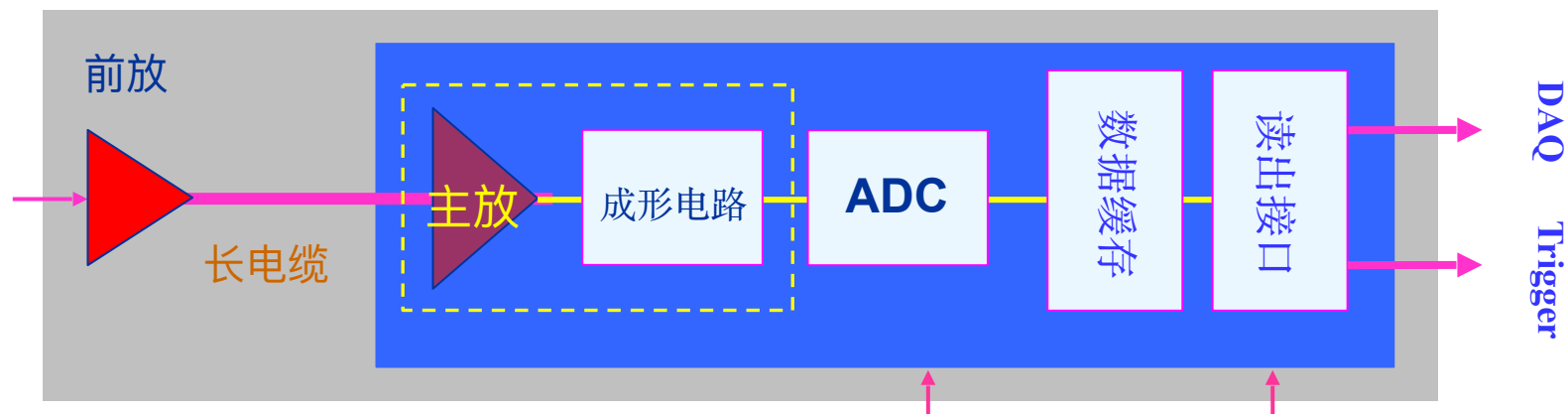
- Change from weak electronic signal to digital data, to let DAQ system reconstruct and record
- Tell trigger system which particle have been hit, as original information for trigger system
- Do some pre-process to data, such as data compression, data normalization

# Front-End readout electronics

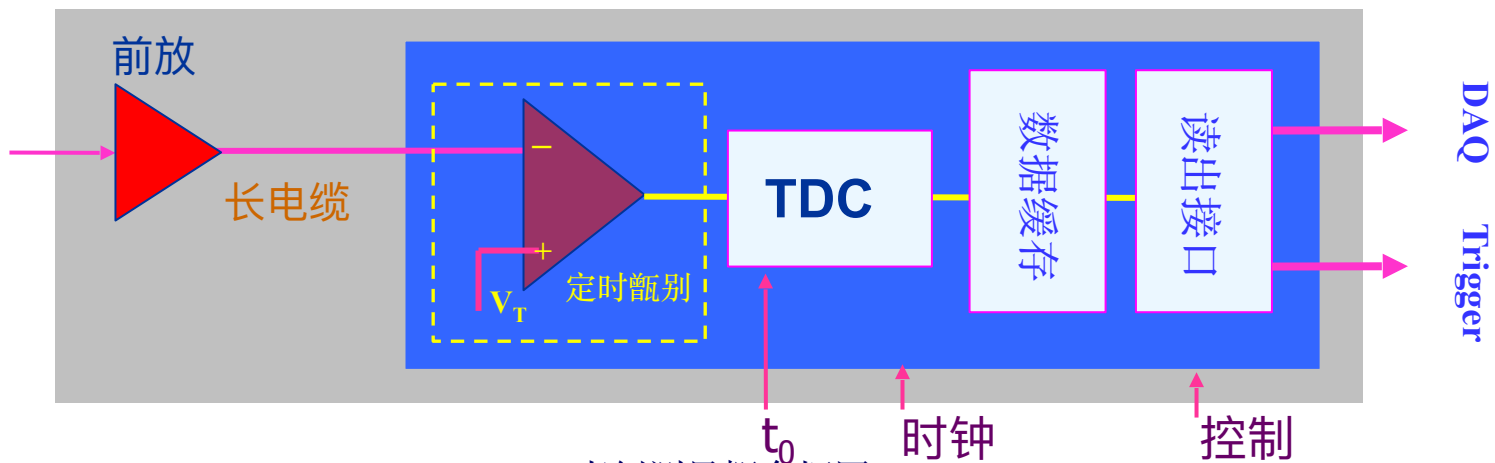
- Some items that spectrometer measures: position, momentum, energy, speed, ionization energy loss, time of flight, etc
- 3 items can reflect all of them:
  - charge(energy)
  - time
  - event number

# Front-End readout electronics

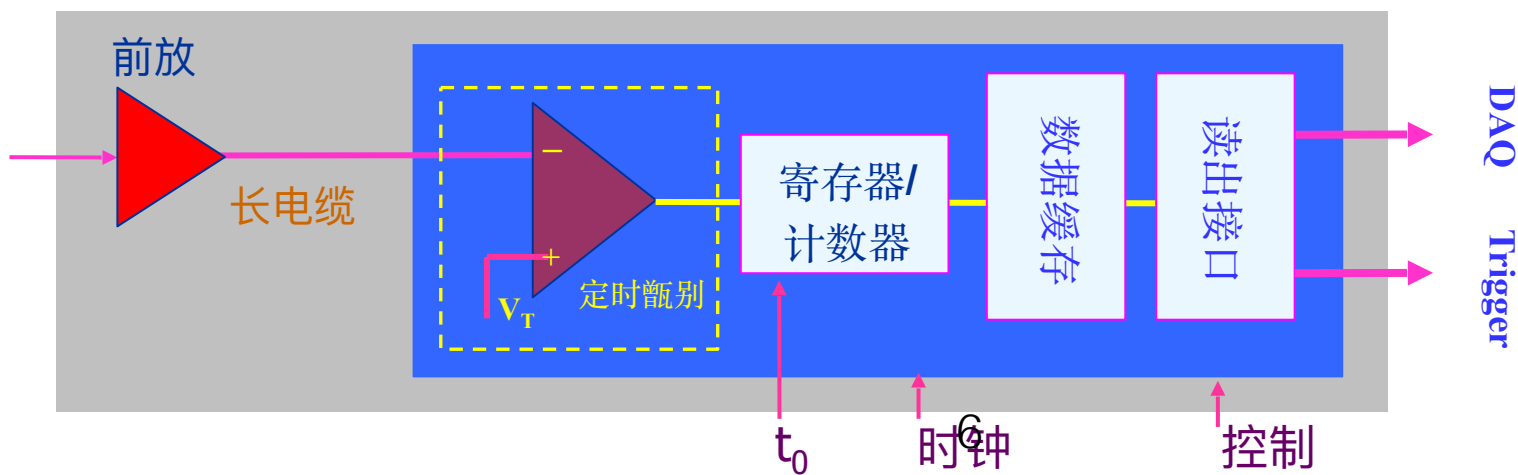
电荷（能量）测量概念框图



时间测量概念框图



事例测量概念框图



# Trigger System

- A special electronic system to do fast & real-time control
- Select interested event, and reject fake event(background event)
- Decide what front-end electronics and DAQ system should do to every collision

# Trigger System

## ■ 触发子系统

相当于模式识别的  
特征抽取。

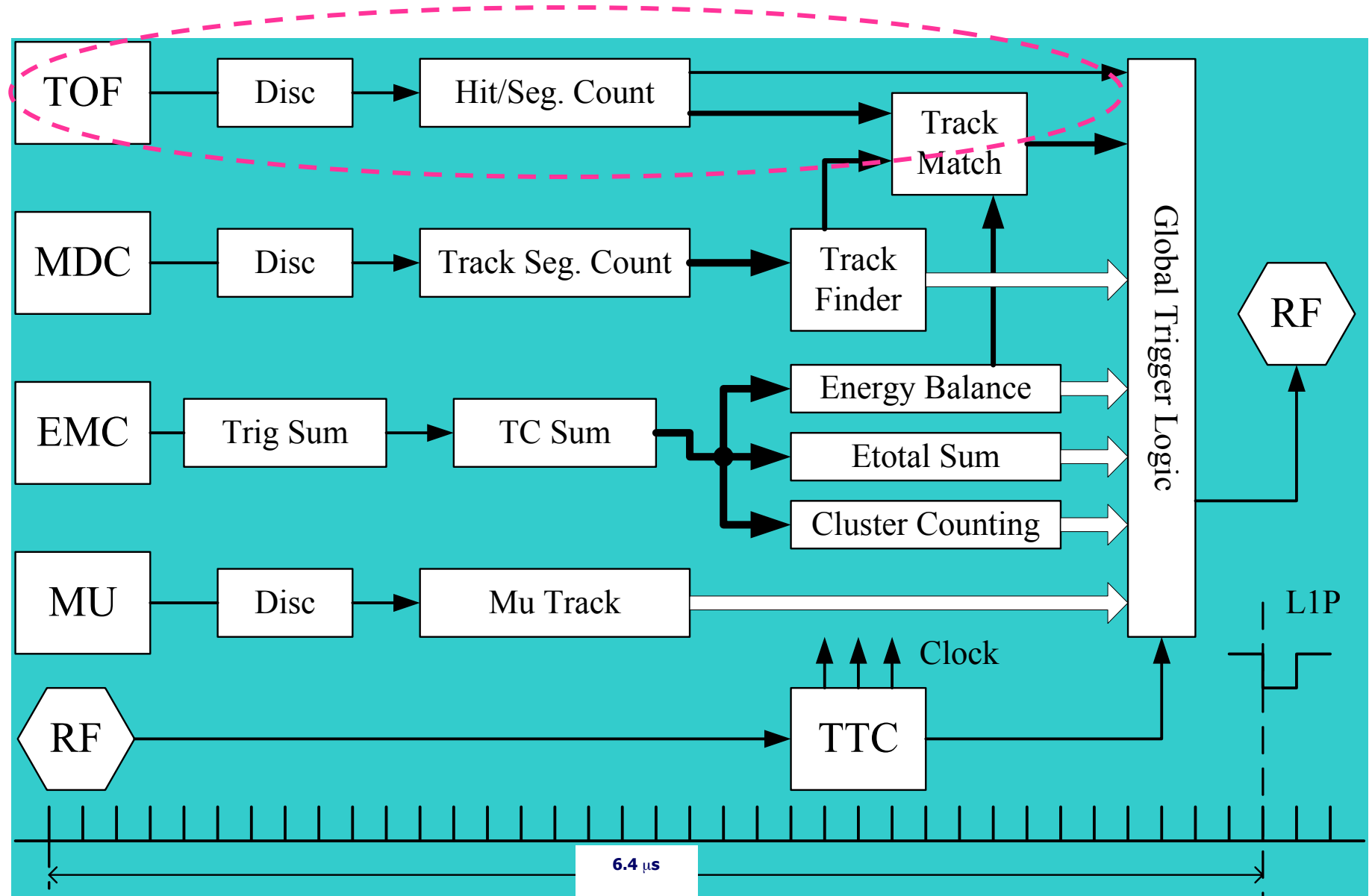
对从各对应子探测器来的信号进行处理，  
得到一些特征信号，  
即触发条件。

## ■ 总触发

相当于模式识别的  
判定分类。

汇集所有特征信号，按照所规定的触发  
条件表进行分类判选。

## ■ 时钟系统

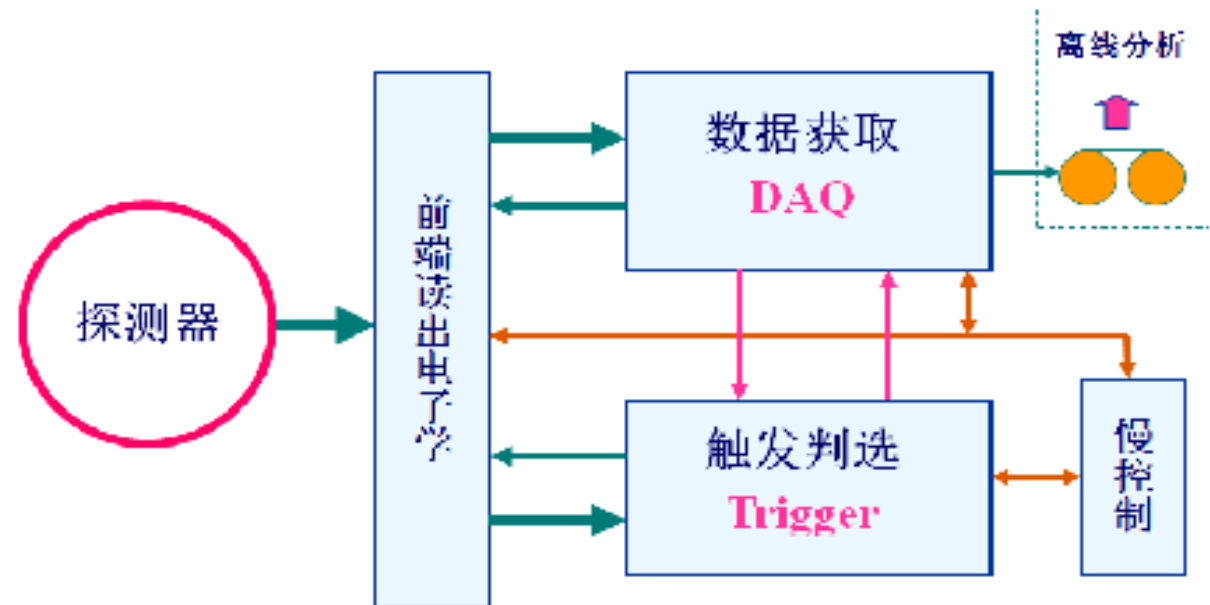


BES III 触发判选系统

# Trigger System

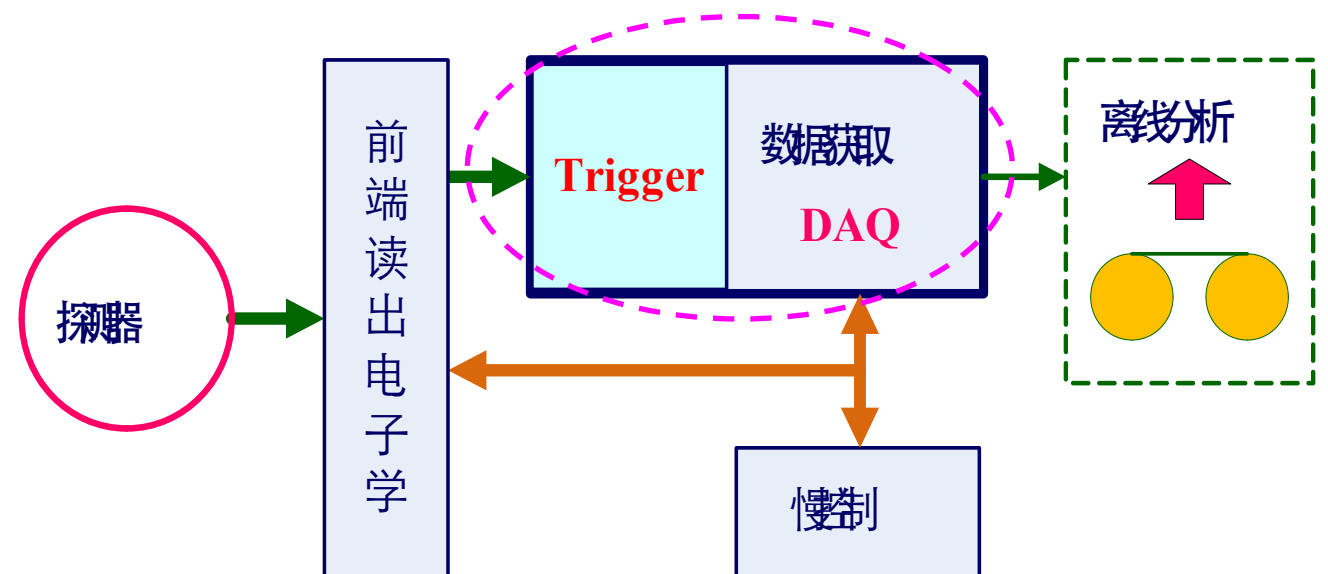
## 传统触发

- ◇ 基于硬件电路实现触发判选
- ◇ 触发信号需送至前端电子学进行数据读取



## “无触发理念”

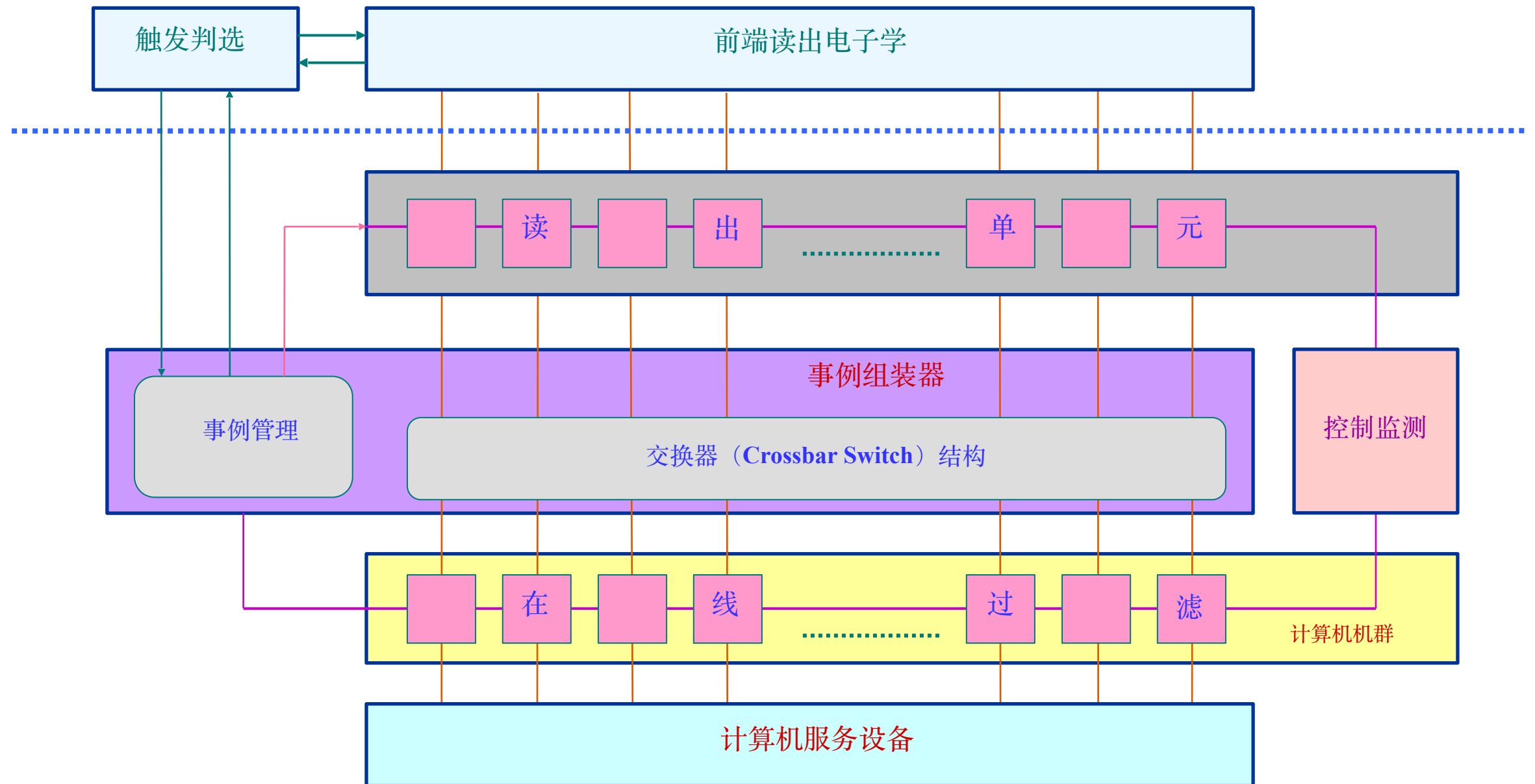
- ◇ 前端电子学所有数据送至后端进行触发判选
- ◇ 不需要触发信号的前馈
- ◇ 最大限度的减少触发硬件,甚至没有
- ◇ 更灵活的触发判选算法



# DAQ

- Collect data from electronics and put them a complete event data, then record on storage(tape or disk)
- System initialize and monitor real-time

# DAQ



Thanks!