

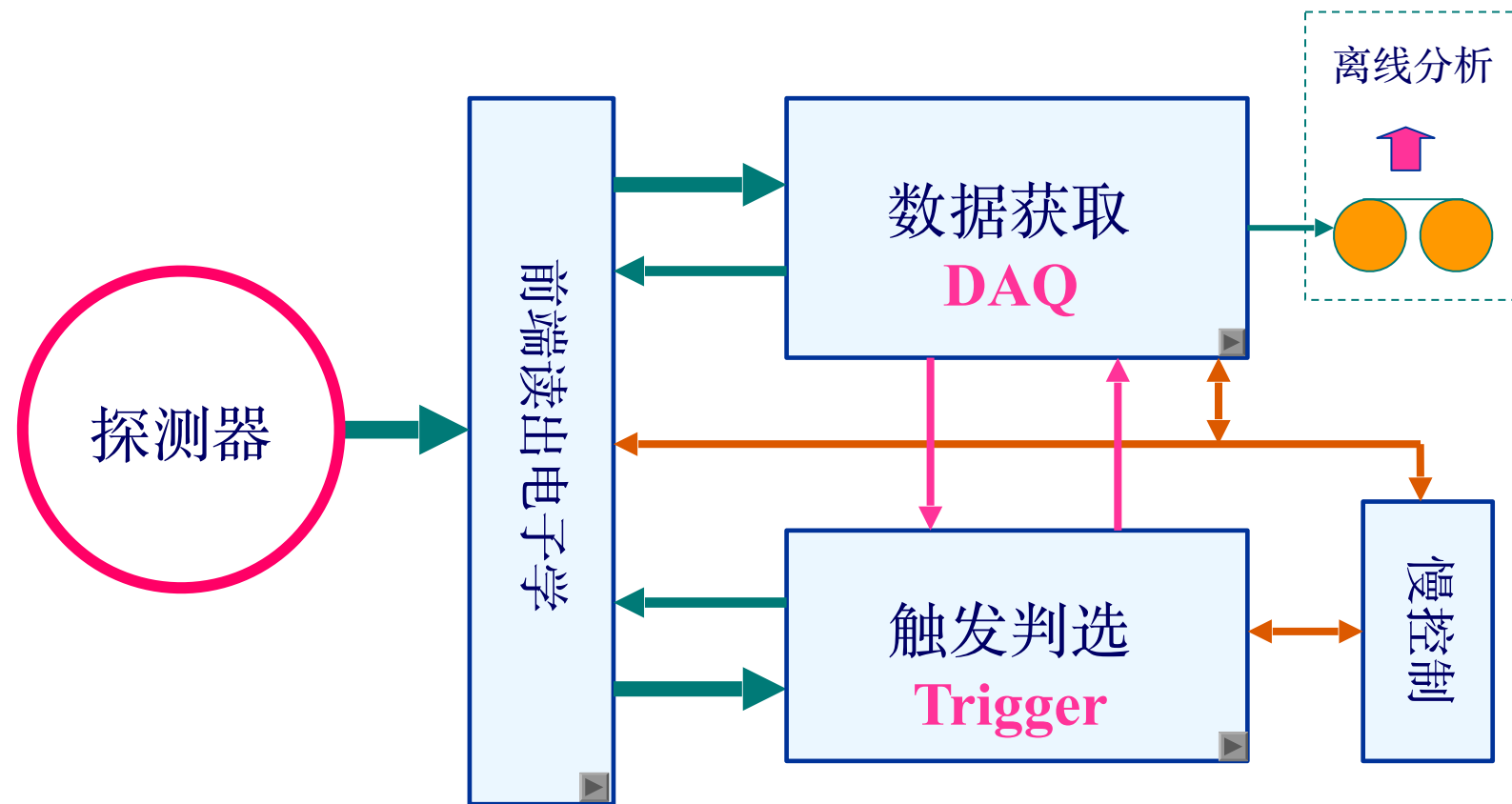
Electronics System

XIAO Suyu from IHEP
20101117

Basic constitution

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

Basic constitution



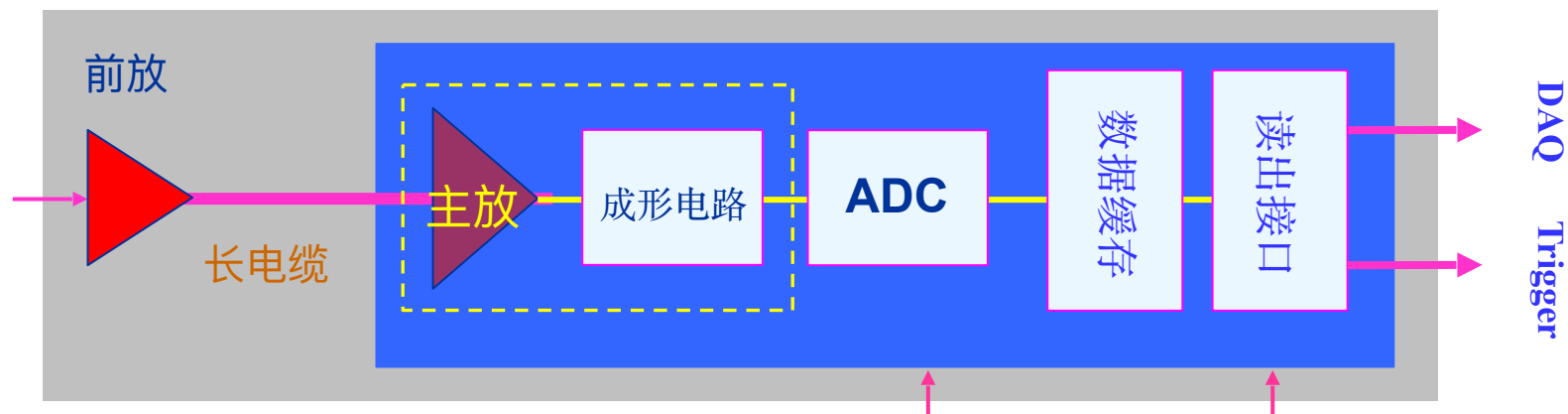
Front-End readout electronics

- 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

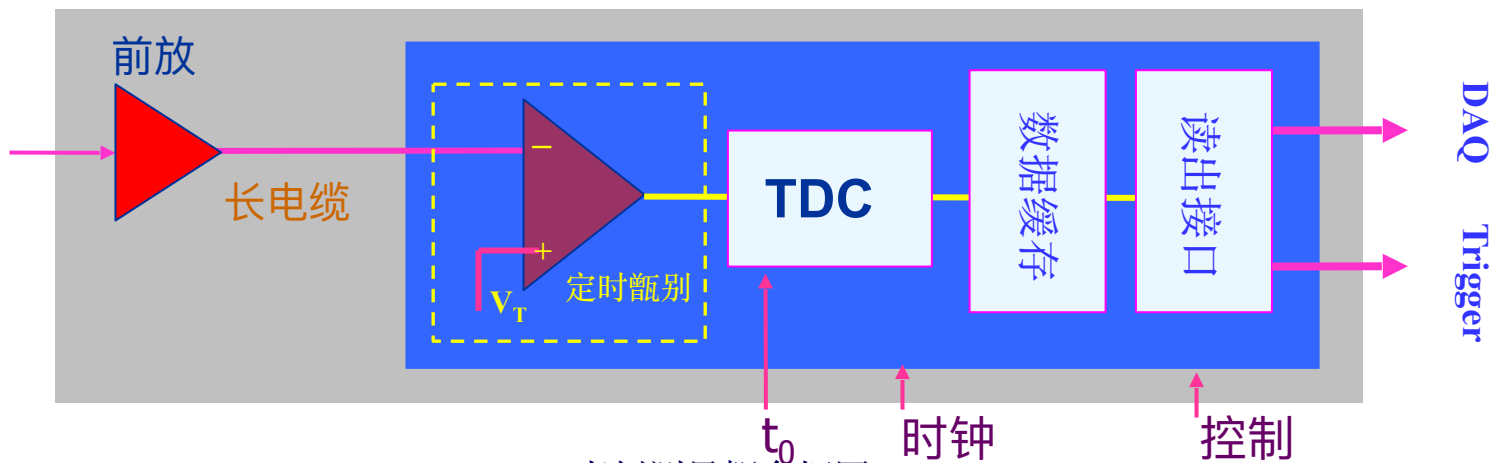
Front-End readout electronics

- 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

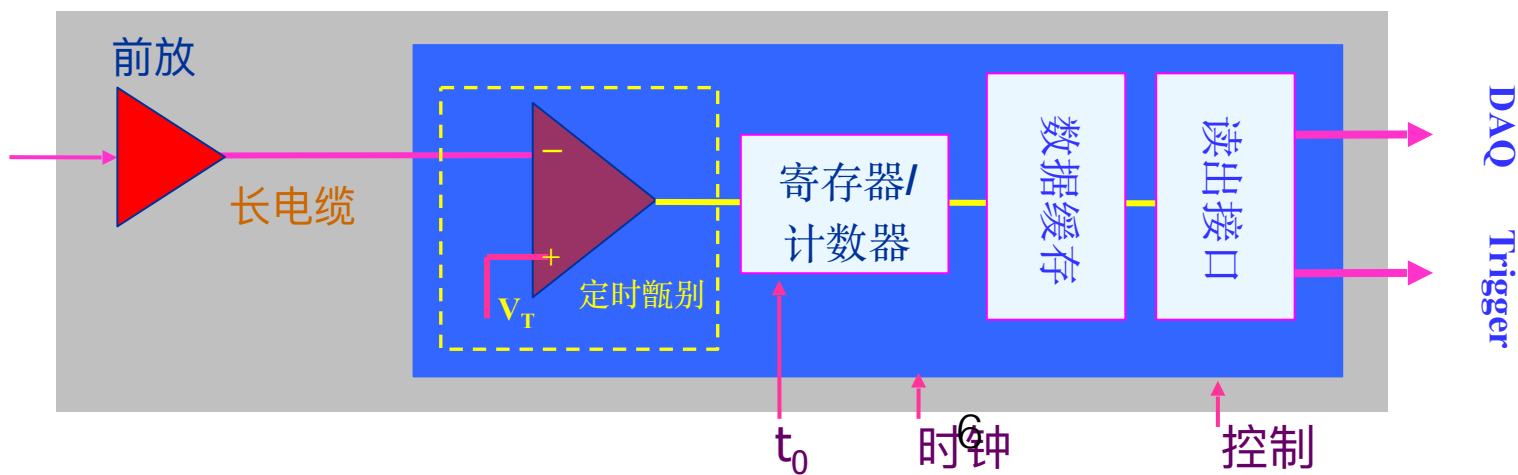
Front-End readout electronics



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。

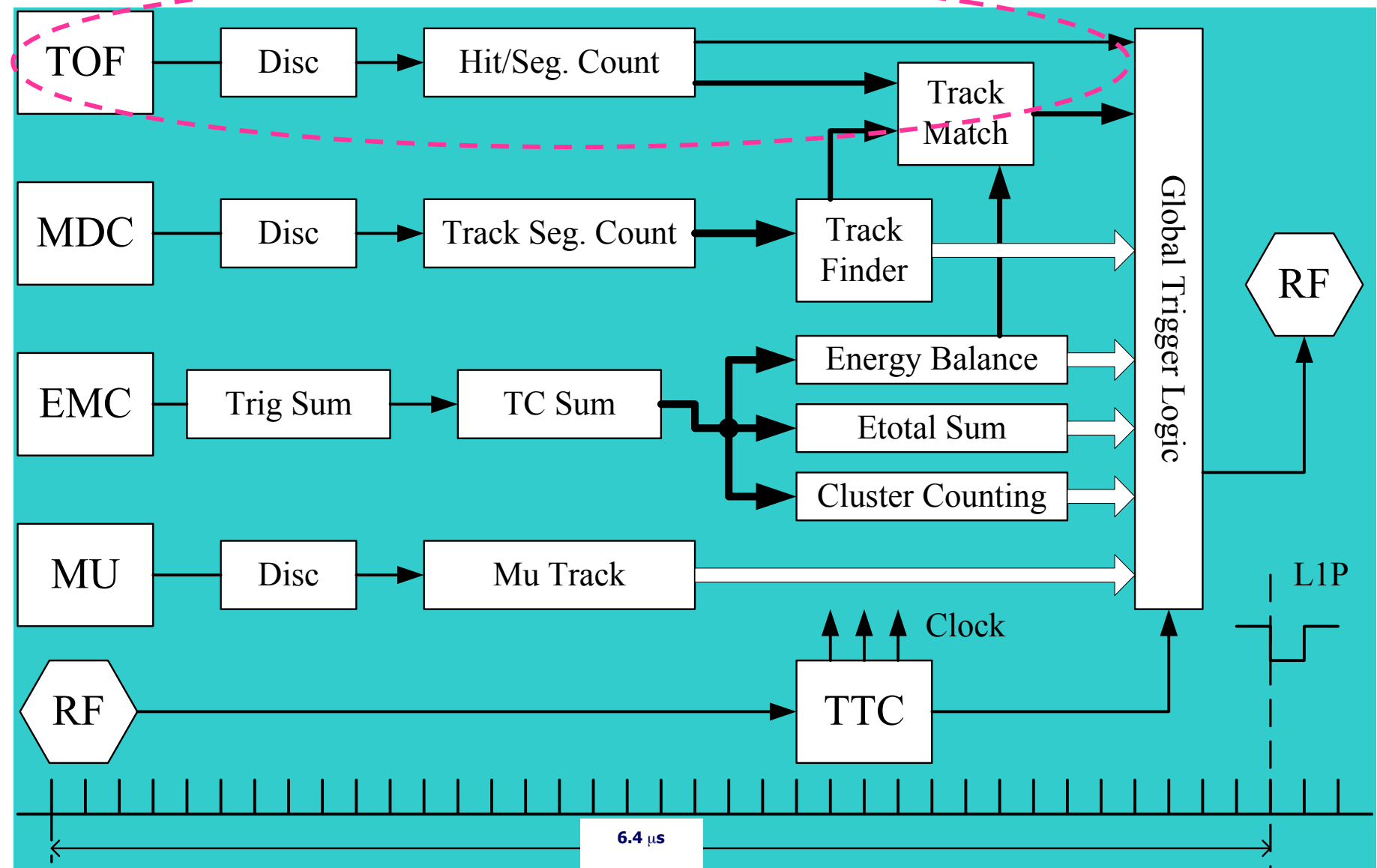
对从各对应子探测器来的信号进行处理，
得到一些特征信号，
即触发条件。

■ 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

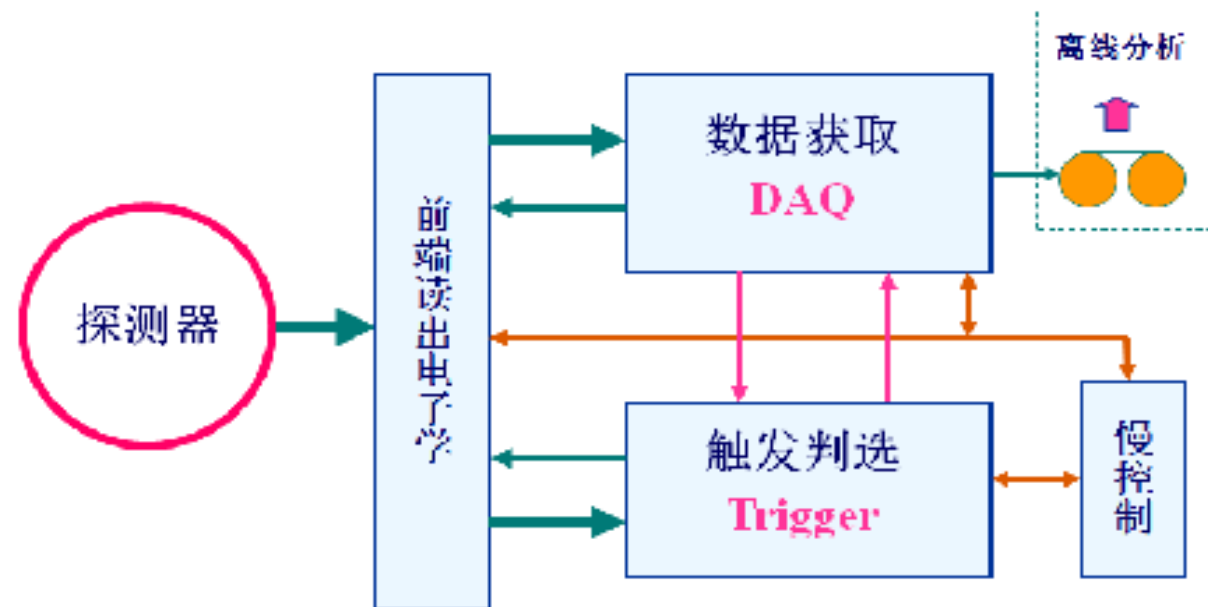


BES III 触发判选系统

Trigger System

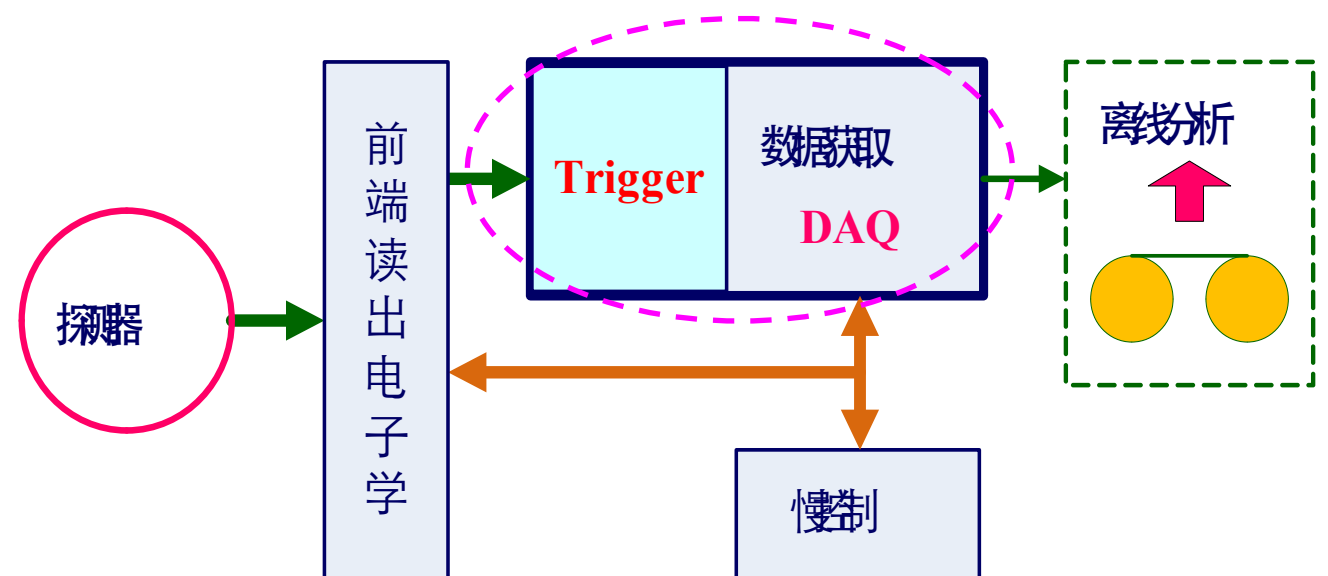
传统触发

- ◇ 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”

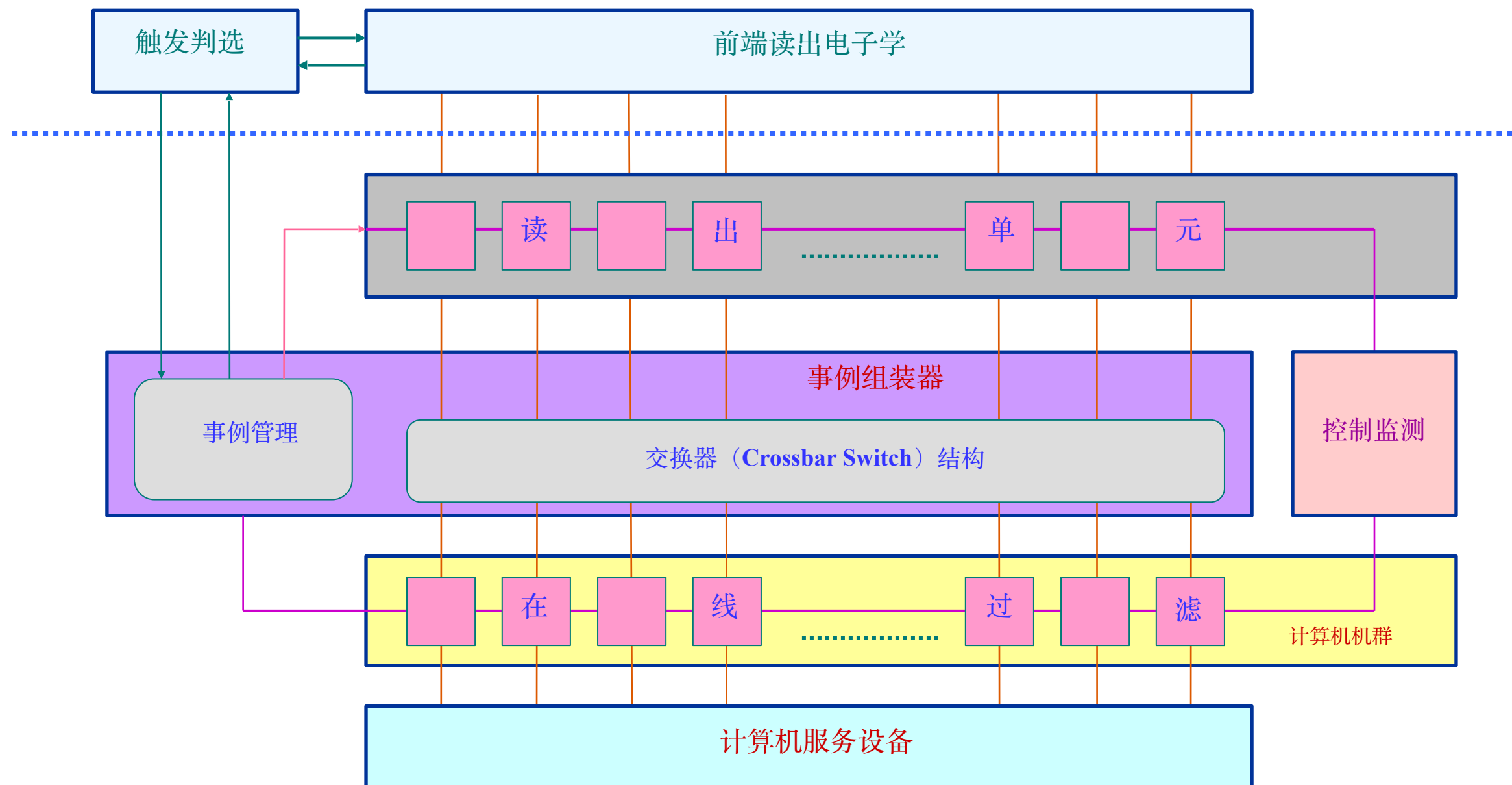
- ◇ 前端电子学所有数据送至后端进行触发判选
- ◇ 不需要触发信号的前馈
- ◇ 最大限度的减少触发硬件,甚至没有
- ◇ 更灵活的触发判选算法



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!