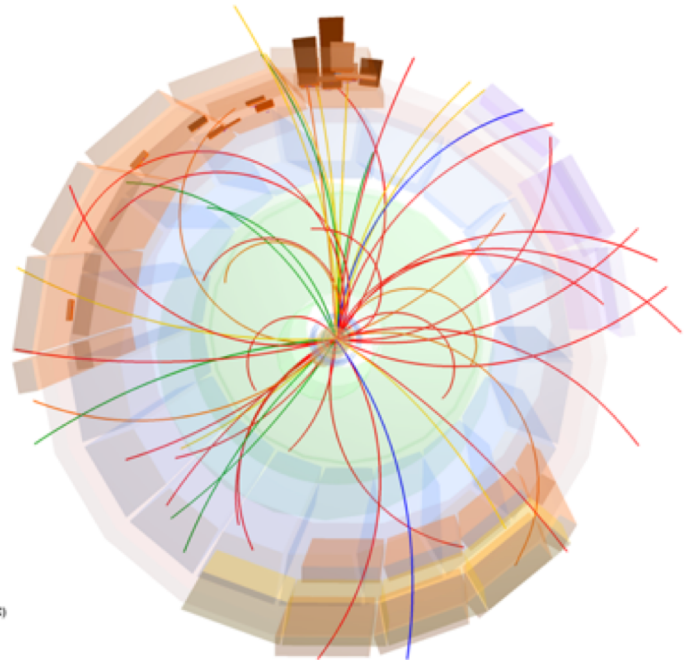
EMCAL in o2
Status and plans



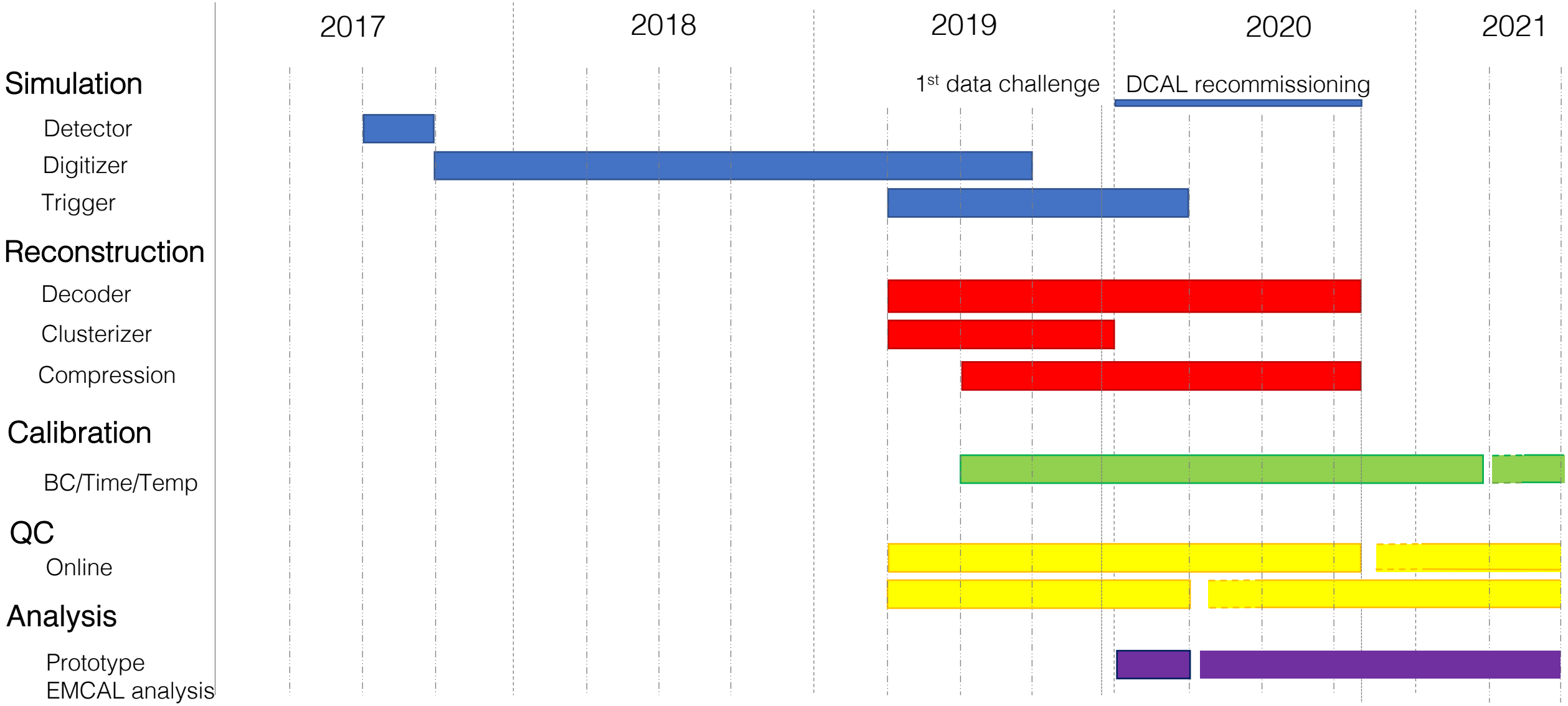
Markus Fasel (ORNL)

for the EMCAL collaboration

ALICE Software and Computing Week,
April 2 – 5, 2019

OAK RIDGE National Laboratory

EMCAL o2 project plan



Simulation / reconstruction status

- Simulation:
  - Geometry: Porting done in 2017
  - Detector: Porting done in 2017
  - Digitizer: Ongoing
  - Trigger simulation: To be started
- Reconstruction:
  - Raw data decoding: Starting now
  - Clusterizer: Starting now
  - Data compression: To be started in Q3/2019

Digitizer update

Anders Knospe (Houston)

- New:
  - Label handling with MC label container
  - Compressed cell format
- Ongoing:
  - Time response function
  - Tests with box generator
- Next:
  - Pileup simulation
  - Refinements from the testbeam analysis

```
// Structure:
// Bits 25-34: ADC
// Bits 16-24: Time (ns)
// Bits  0-16: Tower ID

namespace o2 {
namespace EMCAL {
class Cell {
public:
  Cell() = default;
  Cell(Double_t amplitude, Double_t time, Short_t tower);
  Cell(const Cell& c) { mBits = c.mBits; }
  Cell& operator=(const Cell& c);
  ~Cell() = default; // override

  void setAmplitudeToADC(Double_t amplitude);
  void setADC(Short_t adc);
  Short_t getADC() const;

  void setTime(Double_t time);
  Short_t getTime() const;

  void setTower(Short_t tower);
  Short_t getTower() const;

  void setLong(ULong_t l);
  ULong_t getLong() const { return mBits.to_ulong(); }

  void PrintStream(std::ostream& stream) const;

private:
  std::bitset<40> mBits;
};

std::ostream& operator<<(std::ostream& stream, const Cell& c);
} // namespace EMCAL
}// namespace o2
```

Reconstruction status

Martin Poghosyan (ORNL)

Raw decoder:

- Test setup installed in the EMCAL Lab
- Run3: 42 DDLs and 2 FLPs (40 DDLs from SRU and 2 DDLs from STU)
- Work on implementation started

Clusterizer:

Needed for: Compression, QC

- Work started this week
- Porting from EMCAL HLT clusterizer
- Adaptions in MC handling needed

Ruediger Haake (Yale)

Development starting soon

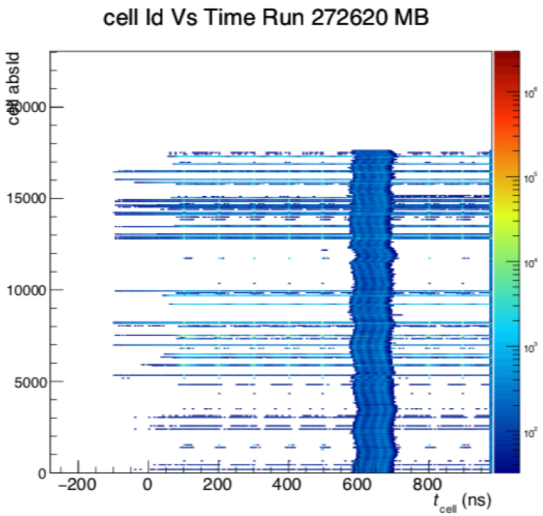
4 Levels

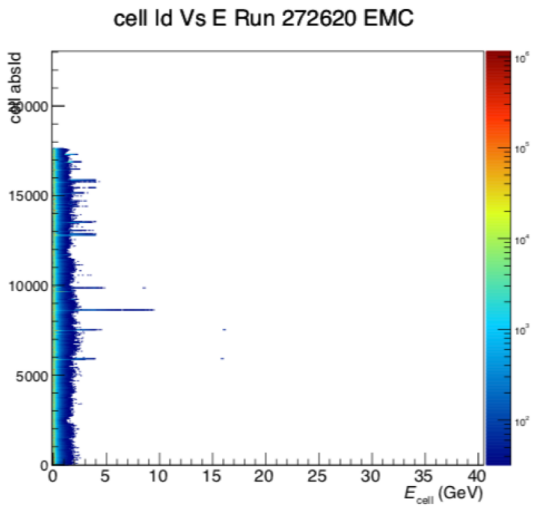
Cells -> FLP, asyc

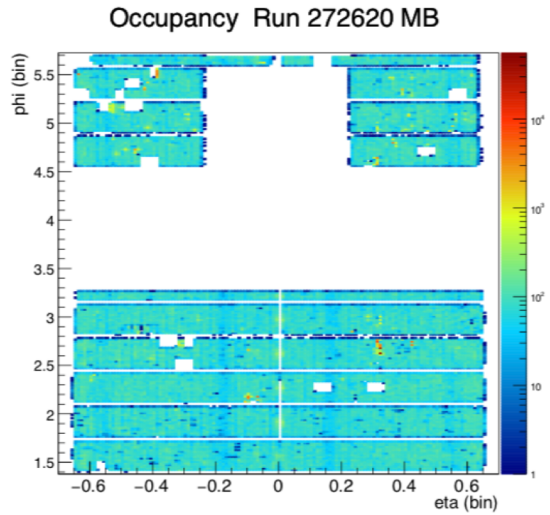
Clusters -> EPN, async

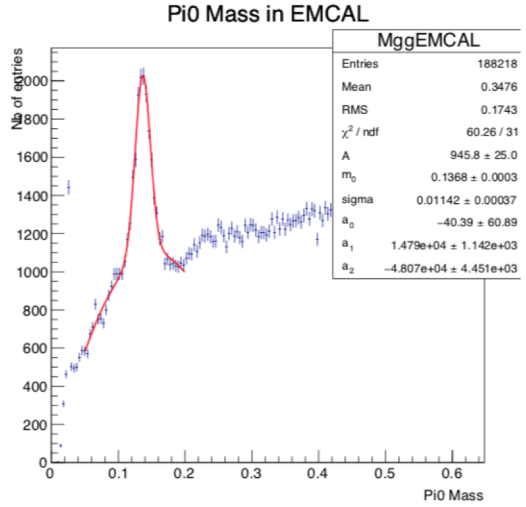
π^0 -> EPN, async

Trigger -> FLP









Summary

- Simulation:
  - Prototype digitizer ready, integrated in the digitizer workflow
  - Ongoing work on time response and pileup simulation
- Reconstruction:
  - Raw data decoding on FLP started
  - Work on the clusterizer starting now
- QC:
  - Starting now

Thanks to the EMCAL o^2 team

Anders Knospe (Houston), Ruediger Haake (Yale), Martin Poghosyan (ORNL), Cristina Terrevoli (Houston)