

CMS GEM Test Beam Plan



B. Dorney

On behalf of CMS GEM Community

Overall Proposal

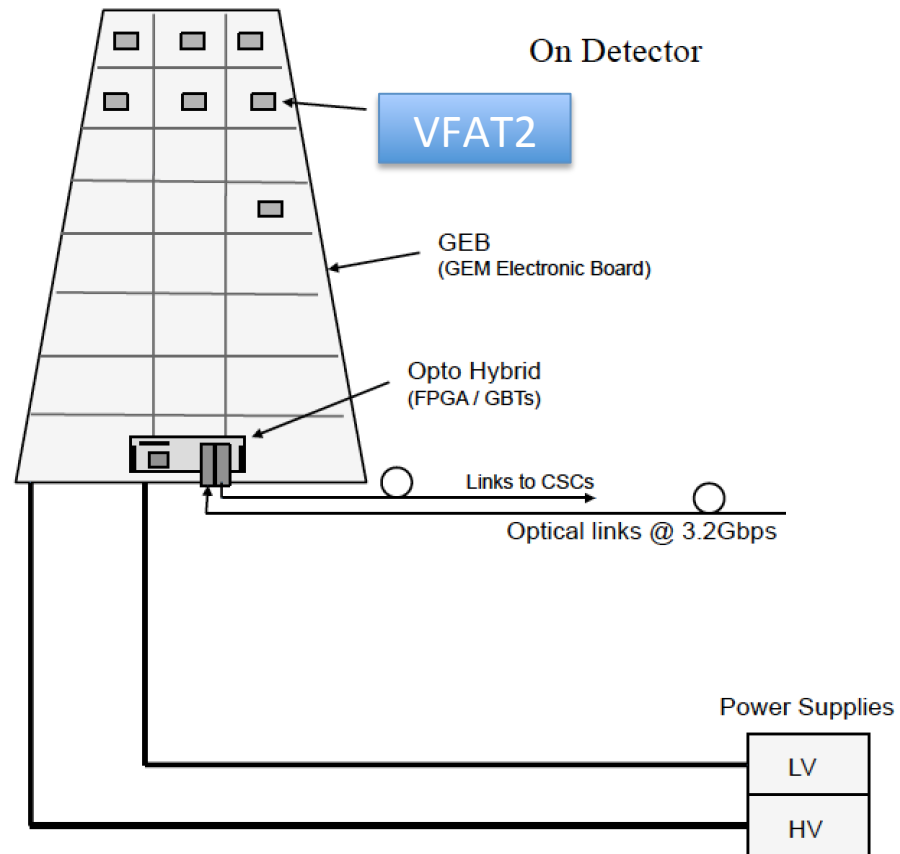


- **Join for last beam period (Oct 21st – Nov 4th)**
- **Two setups this year**
 - CMS GEM DAQ Electronics v2
 - CMS ME0 Prototype
- **No magnetic field**
 - Prefer upstream of magnet

CMS GEM DAQ Electronics v2: On Detector

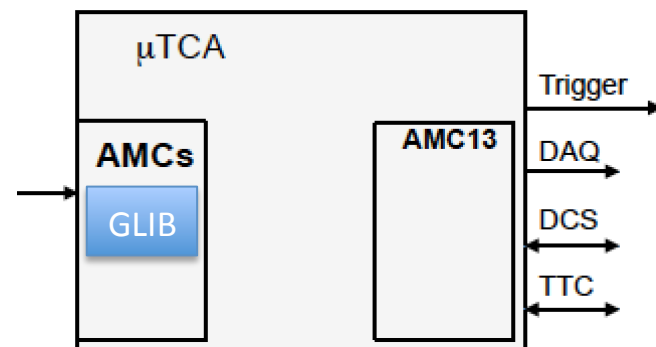


- **CMS VFAT2 Hybrid**
 - Front end ASIC
- **GEM Electronics Board (GEB)**
 - Provides power and communication to 24 hybrids
 - Up from 2-6 hybrids in v1
- **Optohybrid (OH)**
 - FPGA concentrator
 - Controls 24 hybrids (up from 6)
 - Sends data up DAQ chain



- **GLIB**
 - Communicates with OH
- **AMC13**
 - Special CMS specific MCH
 - Communicates with CMS central DAQ

Off Detector

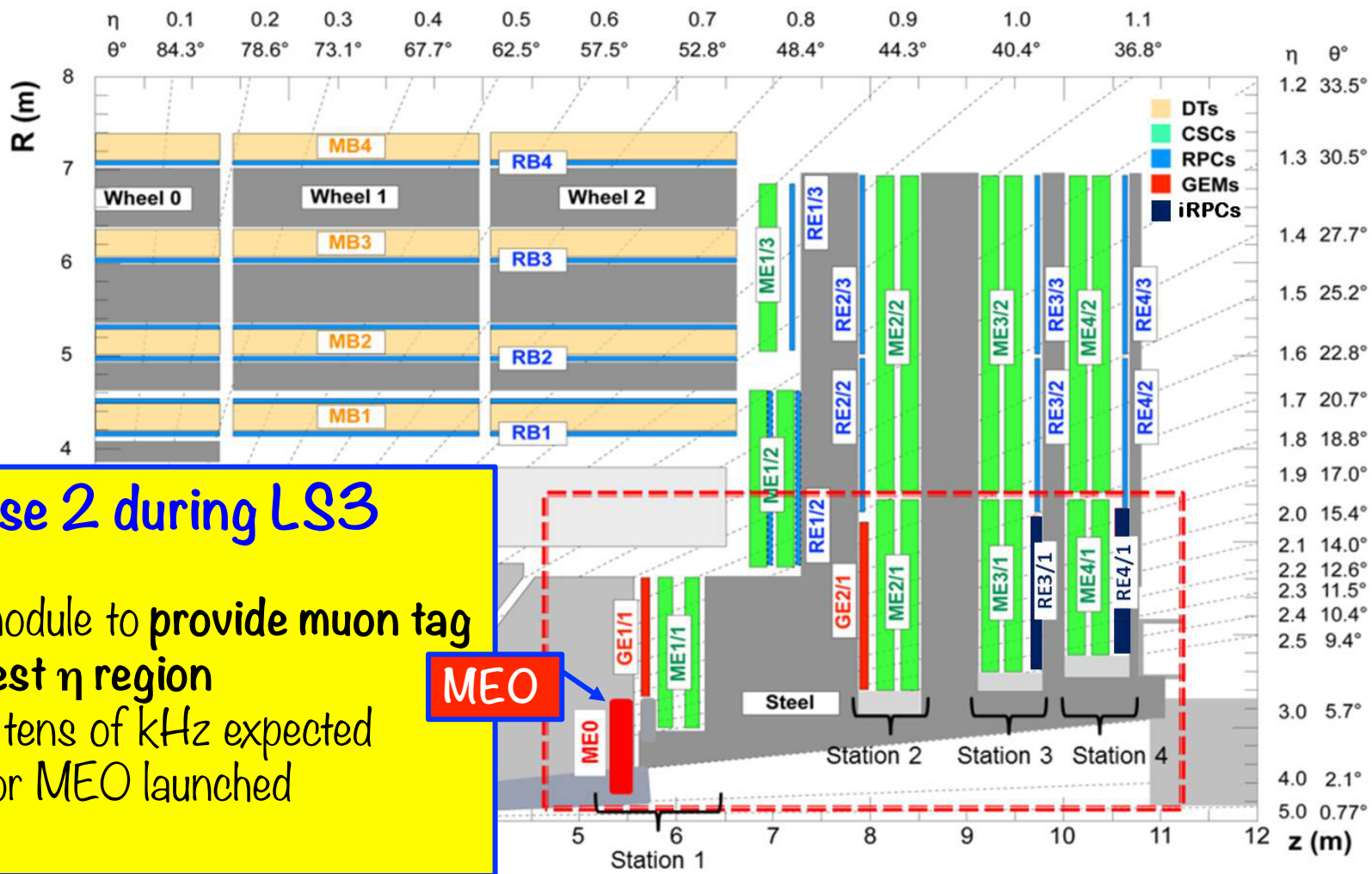


CMS GEM DAQ Electronics v2: Measurement Goal



- **Two detectors in CMS superchamber configuration**
- **Performance measurements with CMS GEM electronics**
 - Tracking + timing data
- **Stress test of DAQ chain**
 - AMC13 trigger input and XDAQ software framework
- **Provide our own tracking detector**
- **No magnetic field**
- **Beams: muons, and *high* rate pions**
- **Target date: Oct 21st – Nov 4th**

CMS ME0 Prototype: CMS Phase II Upgrade



Phase 2 during LS3

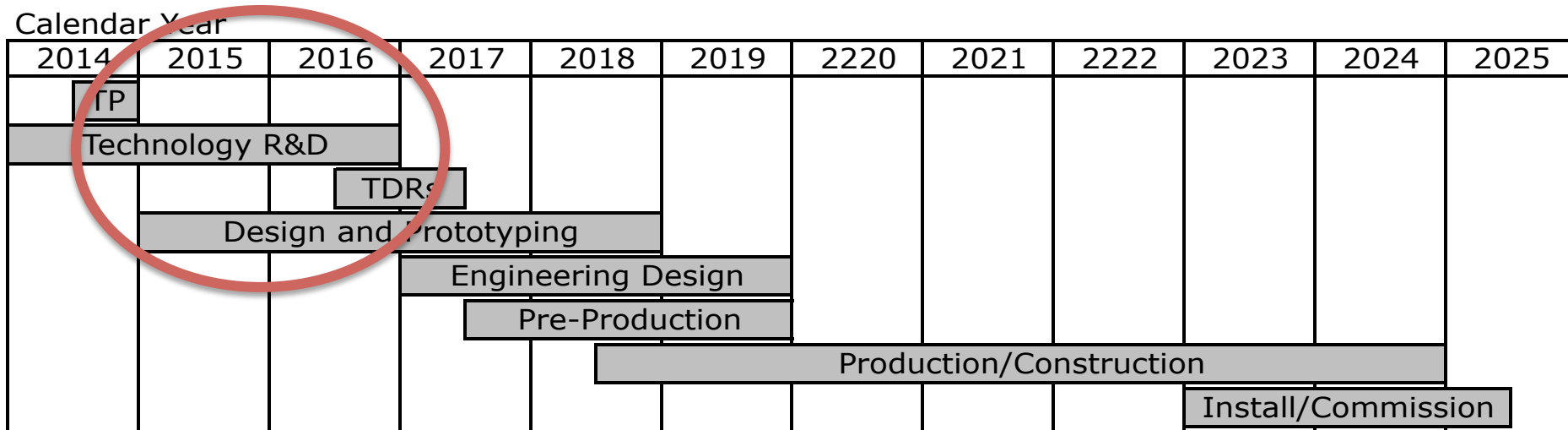
- MEO module to provide muon tag in highest η region
- Several tens of kHz expected
- R&D for MEO launched

MEO

CMS ME0 Prototype: CMS Phase II Upgrade



- **New R&D project**



- **New MPGD technologies**

- μ RWELL, G. Bencivenni et al. JINST 10 P02008 2015
- FTM, R. De Oliveira et al. CERN-OPEN-2015-002
 - Also, INFN-15-01/BA and arXiv:1503.05330[physics.ins-det]

CMS ME0 Prototype: Measurement Goal



- **First performance measurements in beam**
 - HV scans: timing, transparency, efficiency, etc...
- **Possibly borrow RD51 tracker?**
 - Under investigation, right now prototype has only one readout channel
 - Separate DAQ system from previous setup
- **No magnetic field**
- **Beams: muons**
- **Target date: Oct 21st – Nov 4th**

Experience from Past Test Beams



- **Good idea to have a humidity sensor on the gas line**
- **Good idea to store pipes in climate controlled area**
 - Last year pipes we brought may have collected some condensate in them; caused problems
- **Request for more wall outlets**
 - Last year we had too many things plugged into one power strip; caused problems
 - Long extension cord?

THANKS FOR THIS OPPORTUNITY