Laboratoire d'Annecy-le-Vieux
de Physique des Particules

GM sensor tests and installation

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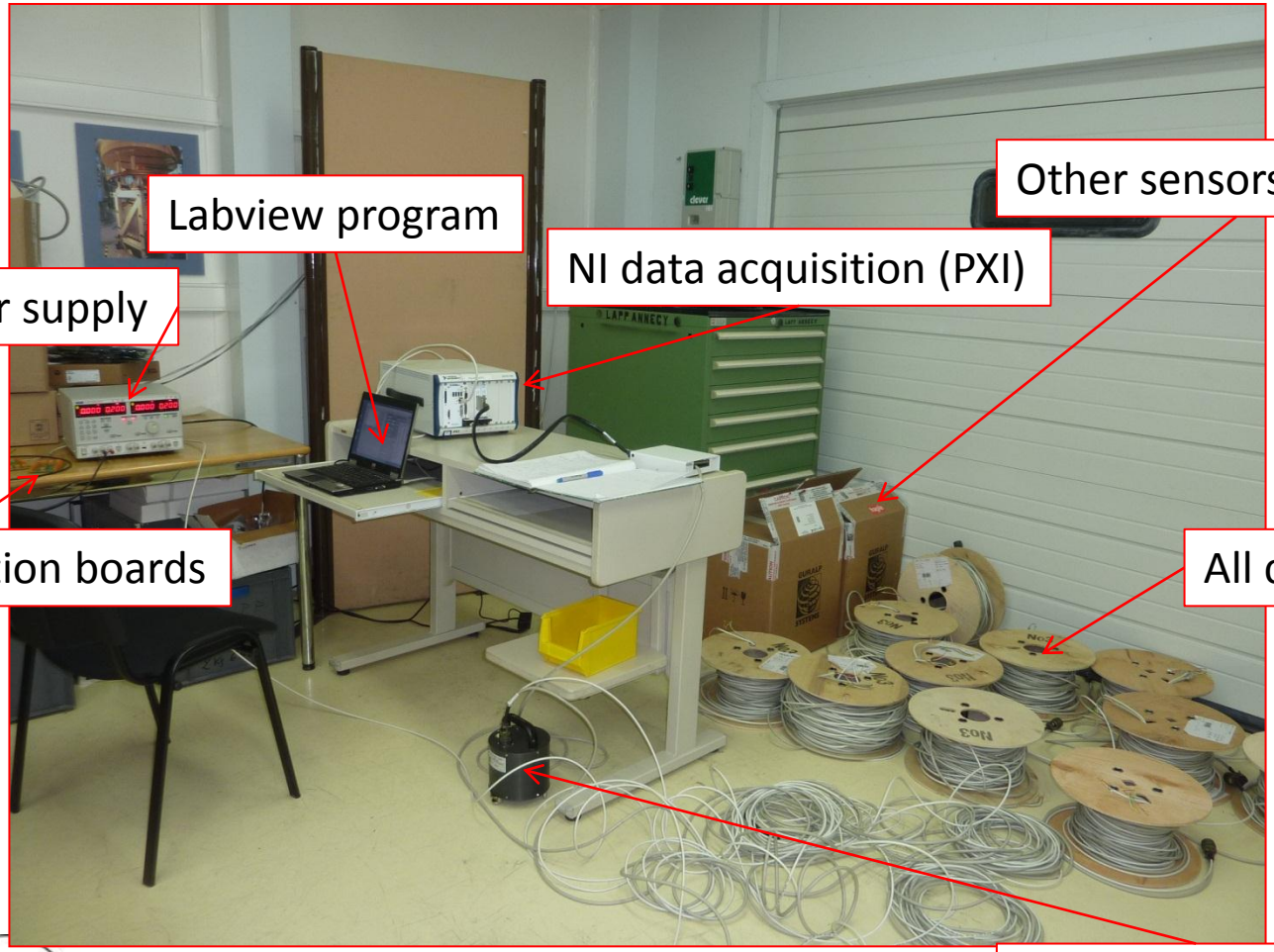
In2p3

LAPP-CERN involvement

- Already done:
  - Purchase by LAPP of 15 Guralp 6T for 52 000€.
  - Purchase by CERN of special low noise long cables
  - DAQ system developed by CERN
- Still to do:
  - Instrumentation preparation by LAPP-CERN: if system with 15 sensors and signal quality OK
  - LAPP installation of cables, sensors and tests at KEK
  - Determine Labview-EPICS connection : CERN, Glenn and LAPP
  - Data handling CERN-LAPP

Set-up


Labview program
Tti Power supply
NI data acquisition (PXI)
Other sensors in boxes
Power distribution boards
All cables available
One sensor cabled

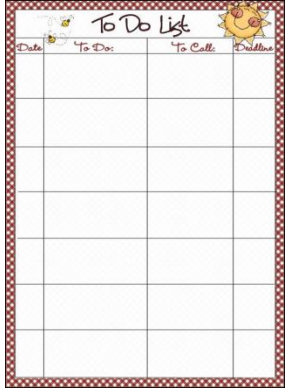
Sensor characteristics

Velocity output bandwidth	*1 s – 100 Hz (Model CMG-6T-1),* *10 s – 100 Hz (Standard) or* *30 s – 100 Hz*
Velocity output sensitivity	*2 × 1200 V/m/s, (Standard)* *2 × 2000 V/m/s or* *2 × 1000 V/m/s*
Peak output	*±10 V (20 V peak-to-peak)*
Optional high gain sensitivity	*2 × 10000 V/m/s (adjustable)*
Lowest spurious resonance	*450 Hz*
Linearity	*> 90 dB*
Cross-axis rejection	*> 65 dB*
Electronics noise level	*–172 dB (rel. 1m2s-4Hz-1)*
Operating temperature	*–40 to +75 °C*
Temperature sensitivity	*< 0.6 V per 10 °C*
Mass recentring range	*±3 ° from horizontal*
Materials	*Hard anodised aluminium case* *Gold plated contacts* *O-ring seals throughout*
Case diameter	*154 mm*
Case height (with handle)	*207 mm*
Weight	*2.49 kg*
Power supply	*10 – 36 V DC*
Optional low power sensor	*5 V DC supply (output ±4.5 V)*
Current at 12 V DC	*38 mA*
Calibration controls	*Common signal & enable lines exposed on sensor connector*
Offset zeroing	*Adjustable through case*
Optional remote control	*Offset zeroing with DC motors*
Optional accessories	*Handheld Control Unit*

Things to do before shipment

- Make the system work for one sensor: Labview program and Power supply…still learning…limited resources
- Make adjustments if needed
- Redo the test for 15 sensors
- Prepare cabling at KEK for the joint for « Open days » => cable soldering possible at KEK or need to prepare our own?
- Prepare the power supply for 60Hz 110V operation
- Prepare the different shipments: CERN material (need to go back to CERN before shipment to KEK?) and LAPP material (directly to KEK)=> sensors can move easily so not a donation, but for more than one year (taxes!)
- Last time (September 2008) between shipment preparation and arrival at KEK after customs, the shipment took 6 weeks. Need to take this into account.

Things to do once at KEK

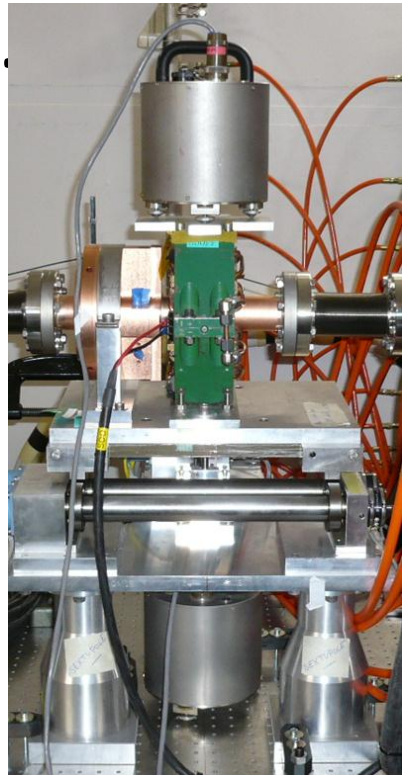


- Unpack 15 sensors and acquisition system.
- Acquisition system in electronics hut in front of QF11X.
- Sensors on floor below sensors : need leveling and orientation to measure vertical and transverse direction (from first magnet after extraction to QD0).
- Place the cables through wall and to the sensors. Are there special instructions for this step?
- Connect (soldering) the extra connectors for OPEN Day passage.
- Start the acquisition of the sensors and make sure everything works as in Annecy.
- Synchronize the measurements with ATF2 (Labview to EPICS and timing).
- Test if one can measure the sensors through ATF2.
- Test if the measurement can be used for feedback/feedforward purposes.

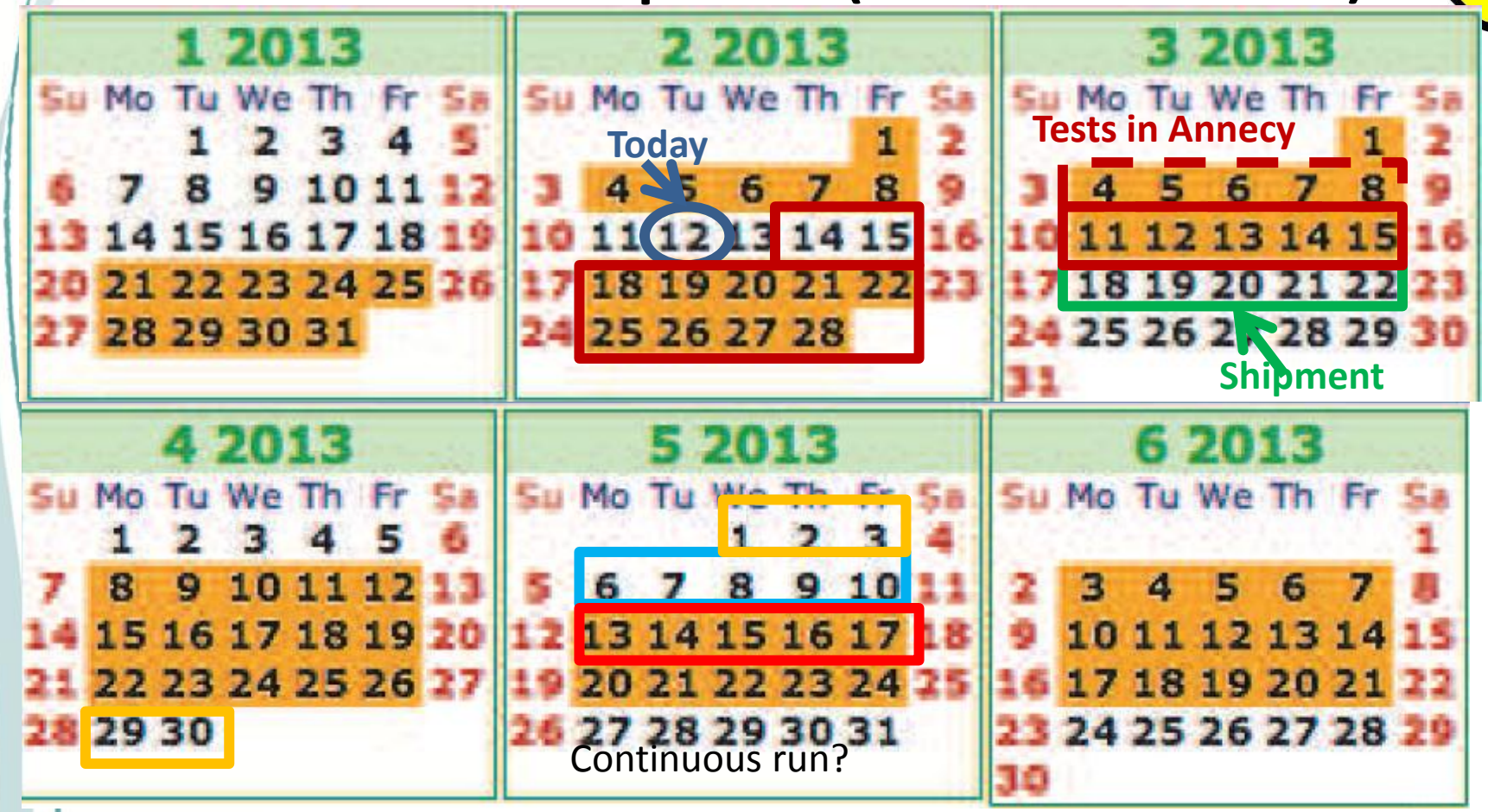
In red: will need help from CERN, SLAC and ATF2 colleagues.

FD versus IP-BPM table vibrations

- With new heavy QD1 and new IP-BPM chamber, it would be good to redo the relative vibration measurements.
- Extra week for measurements?
- Could be quick if one measurement.
- Not necessarily at the same time as sensor installation.



Possible plan (under work)



Still need to optimize the persons needed for operations:

- Golden Week and sensor installation and tests
- Integration (if still needed) and first IP-QF1 relative motion meas.
- Start testing with beam

LAViSta moves to new building in March…

(needs to be compatible with ATF2 work! But room not ready!)

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New room allows precision vibration measurements:

- Ground floor=> avoids vibration amplification
- Oriented to the North=> avoids large temperature variations
- Direct outside door=> easy delivery of heavy objects (magnets, optical tables…)
- 2t crane => move large objects
- 2m hole => low noise measurements for sensor characterization