

MERIT Experiment – Status of Activities at CERN

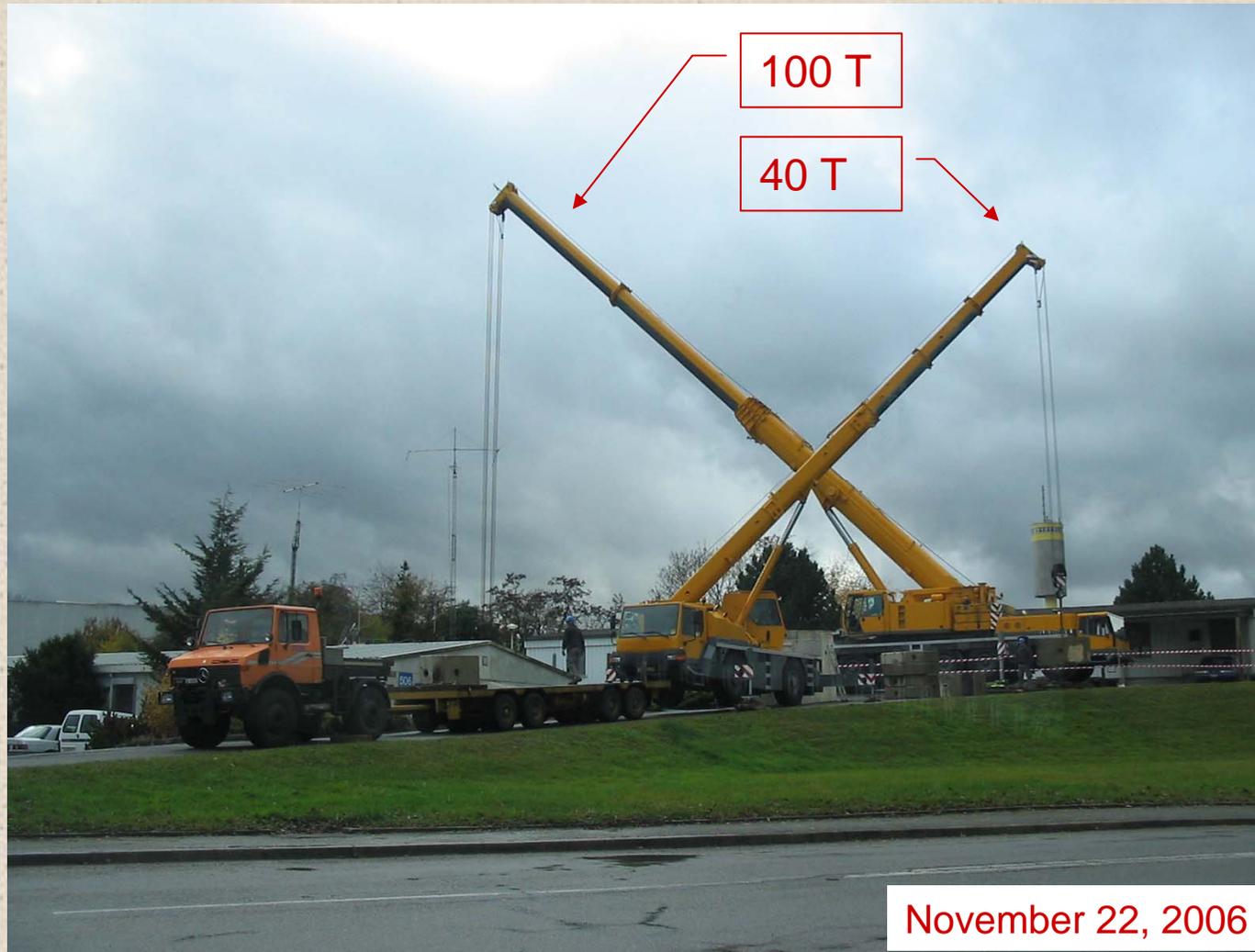
Outline

- Activities in TT2/TT2A
- Cryogenics
- Particle detectors

I.Efthymiopoulos
(for the CERN team)

Target Meeting
December 8, 2006

Opening of TT2 shaft



...Opening of TT2 shaft



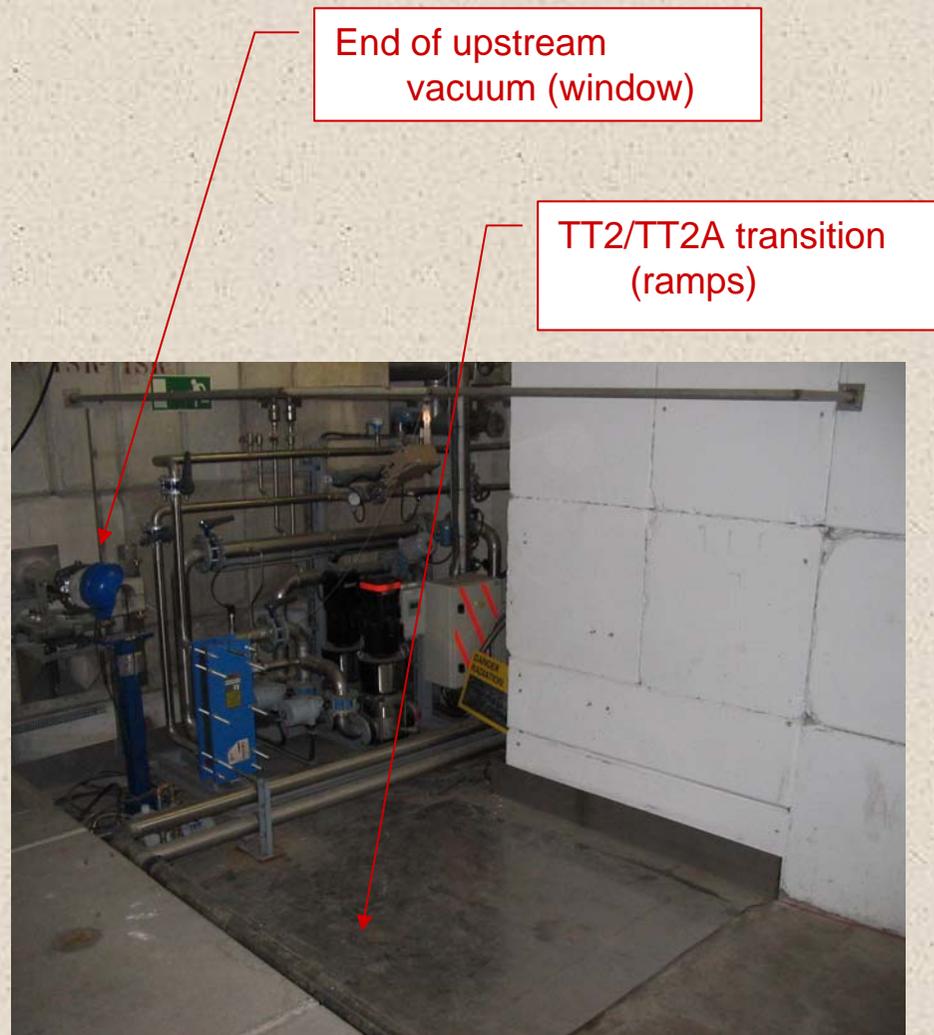
Dismounting of FTN line

- The area where MERIT will be installed is completely free
 - The two BENDs are stored in the TT2A tunnel downstream of our setup
 - The two QUADs that we will use are moved on the side

- All vacuum pipes are removed
 - Each piece has been identified to allow easy re-installation for nTOF

- The area upstream next to the cooling unit for nTOF has been cleared to receive the ramps
 - Access ramps:
 - the TT2/TT2A transition
 - reception under the shaft
 - Are being fabricated – almost completed
 - Will be installed before Xmas

... Dismounting of FTN line



... Dismounting of FTN line



2 big BENDs of FTN line

Shielding blocks for the
beam attenuator
already lowered in TT2



Access Door D201 for TT2/TT2A tunnels



Tests with transport equipment



- Tests with dummy load to see if the tractor and trailer can cope with the 7% slope
- Detailed study of the transport scheme ongoing



Drilling

View from TT2



- In spite of many unexpected difficulties the three holes are now completed
- A SS tube is inserted in each hole



View from TT2A



Detailed of large hole – stones between the concrete walls

Cryogenics

- DVB end of the week – early next week at CERN
- CERN crew ready to complete the instrumentation
 - Completer x-fer lines and test setup
 - 90% ready before Christmas – test right after vacations!

Dewar installed outside
bat.180 for surface
tests



Other activities

- **Power supply**
 - AC cell work ongoing
 - Power supply control ~half-way done

Particle Detectors

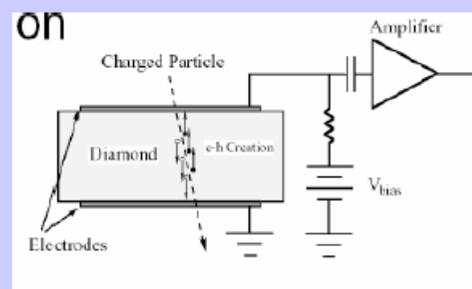
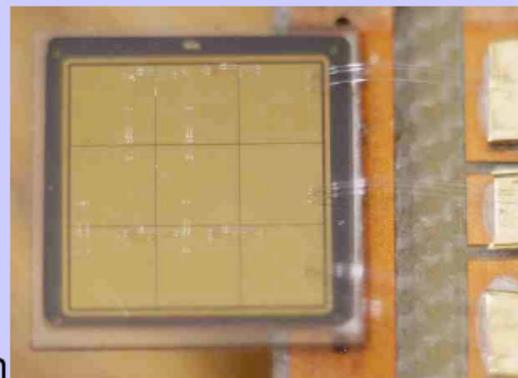
- Test with ACME (Aluminium Cathode Electron Multiplier) detector in H2 beam line
 - Tested up to 10^8 particles / spill (4.8 sec)
 - Tested in magnetic field up to 400 Gauss
 - Results as expected → report from Marcus in preparationACME remains our backup solution for MERIT

- Discussions with CERN experts on diamond (polycrystalline) detectors
 - Used for beam condition monitors in LHC detectors
 - pCVD diamonds are commercially available
 - Typical packaging is 0.8x0.8 cm² detectors
 - Plan to order 6 pieces, use 4 in MERIT
 - ~1000 euro / detector; ~8-10 weeks delay
 - Readout with fast digital oscilloscope

...Particle Detectors

DETECTOR – pCVD diamond

- Radiation hard
 - Shown to withstand $> 10^{15}$ p/cm²
- Fast and short signal
 - High charge carrier velocity
 - Narrow pulses due to short charge lifetime
- Operates with a high drift field
 - Carrier velocity close to saturation velocity
- Very Low leakage current after irradiation
 - Does not require detector cooling
- Some parameters of BCM diamonds:
 - Developed by RD42 / Element Six Ltd.
 - Charge collection distance (ccd) 150 to 220 mm
 - Thickness range 350 to 500 mm & drift field = 2 V/mm
 - Size 10 x 10 mm²



RADMON WG
Mar 22, 2005

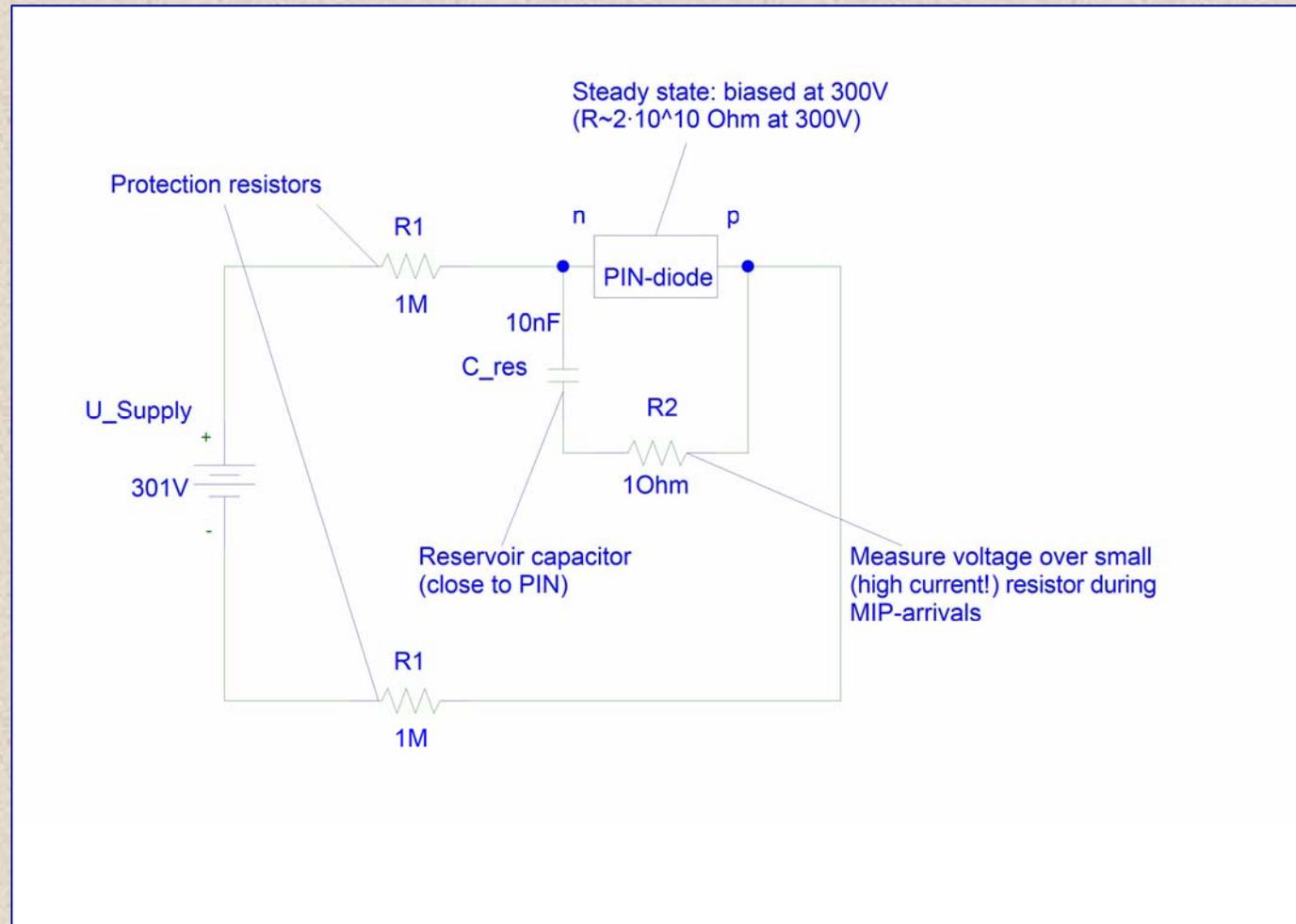
Beam Conditions Monitors in ATLAS

Andrej Gorišek
CERN & J. Stefan Institute



...Particle Detectors

- Huge signal in our case – no amplification is needed
 - Perhaps use attenuator to protect the scope!!!



Summary

- Quite lot of work in the area. Things are progressing as scheduled !
- Tests with one candidate detector for the particle flux monitoring successful – backup solution verified.
- Detector system using pCVD diamonds defined – ordering of sensors hopefully before Christmas
- Things to follow before Christmas:
 - Cryogenics with the DVB and preparation of the tests
 - Installation of the access ramps and dump in the TT2A line
 - Clarify/finalize transport issues
 - **CERN closes between December 22 to January 8th.**