# MERIT Experiment – Status of Activities at CERN

**Outline**

- Activities in TT2/TT2A
- Cryogenics
- Particle detectors

I.Efthymiopoulos
MERIT –VRVS Meeting
December 6, 2006

# Opening of TT2 shaft

# …Opening of TT2 shaft

# Dismounting of FTN line

- All elements of FTN line have been removed
- 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
  - They are being fabricated
  - Will be installed before Xmas

# Access Door D201 for TT2/TT2A tunnels

# Tests with transport equipment

# Other activities

- **Drilling**
  - Ongoing – first (big) hole already done
  - Today finishing the second – small one
- **Power supply (Adrian for details)**
  - AC cell work ongoing
  - Power supply control ~half-way done
- **Cryogenics**
  - DVB end of the week – early next week at CERN
  - CERN crew ready to complete the instrumentation
    - Complete transfer lines and test setup
    - 90% ready before Christmas – test right after vacations!

# Particle Detectors

- Test with ACME (Aluminium Cathode Electron Multiplier ) detector in H2 beam line
  - Tested up to $10^8$ particles / spil (4.8 sec)
  - Tested in magnetic field up to 400 Gauss
  - Results as expected → report from Marcus in preparation

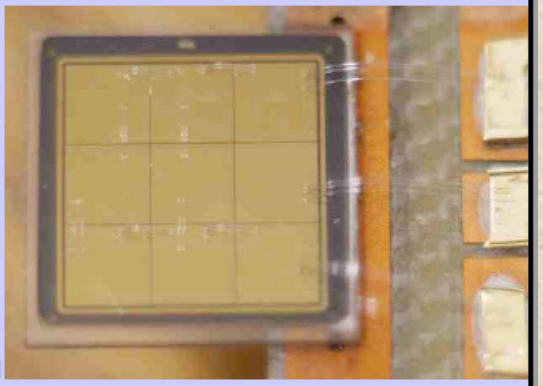
  ACME remains our backup solution for MERIT

- Discussions with CERN experts on diamond (polycrystaline) detectors
  - Used for beam condition monitors in LHC detectors
  - pCVD diamonds are commercially available
    - Typical packaging is 0.8x0.8 $cm^2$ detectors
    - Plan to order 6 pieces, use 4 in MERIT
      - ~1000 euro / detector; ~8-10 weeks delay
  - Readout with fast digital oscilloscope

# …Particle Detectors

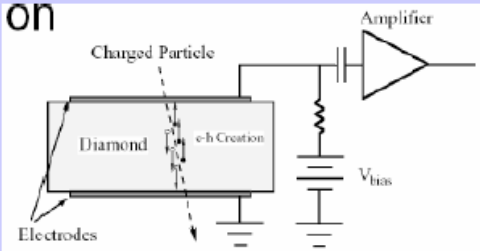
## DETECTOR – pCVD diamond

- 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 $mm^2$

on



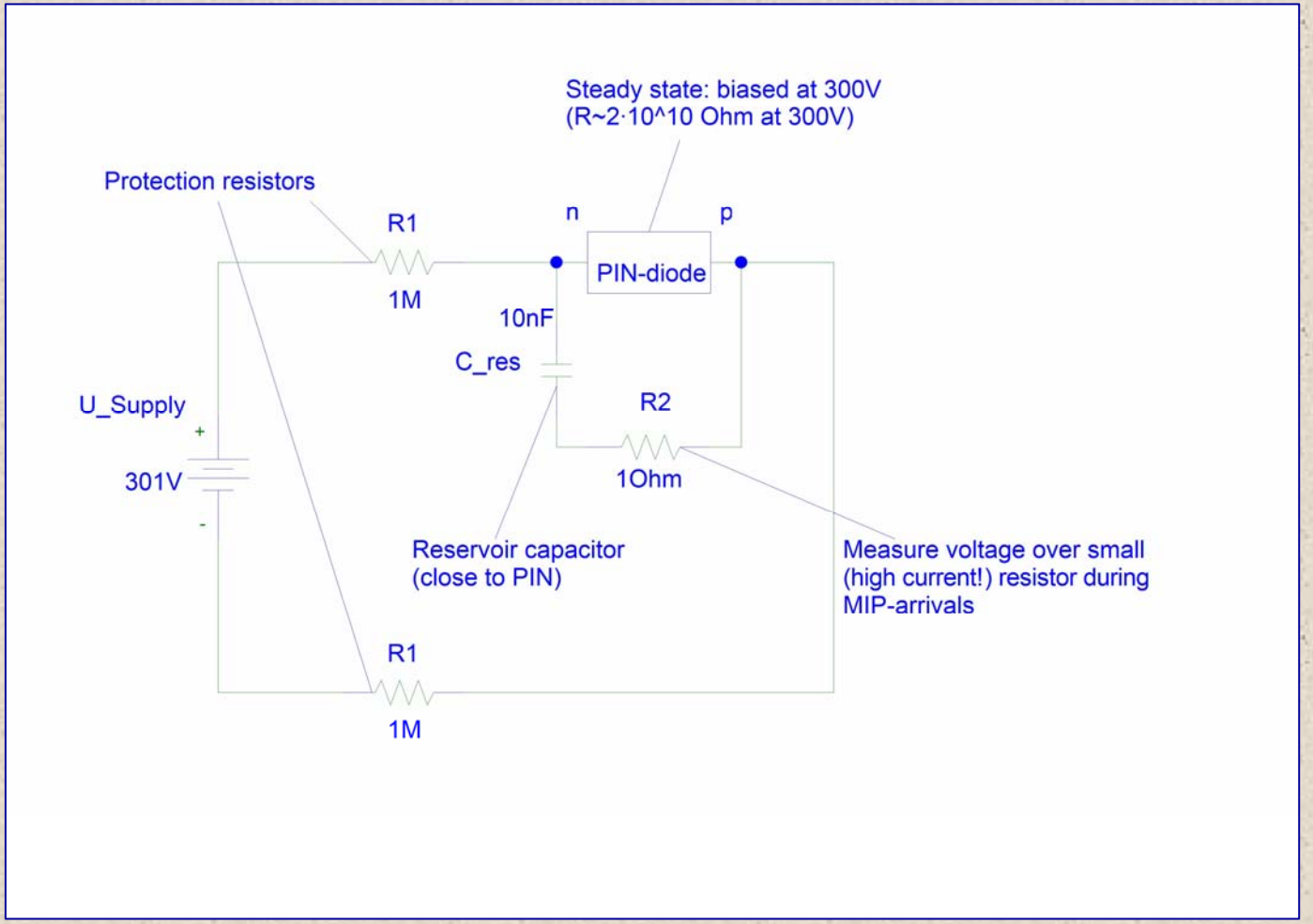

RADMON WG
Mar 22, 2005

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

- Significant progress in several fronts:
  - Installation activities in the tunnel
  - Path defined for particle detectors
- 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 8$^{th}$.**