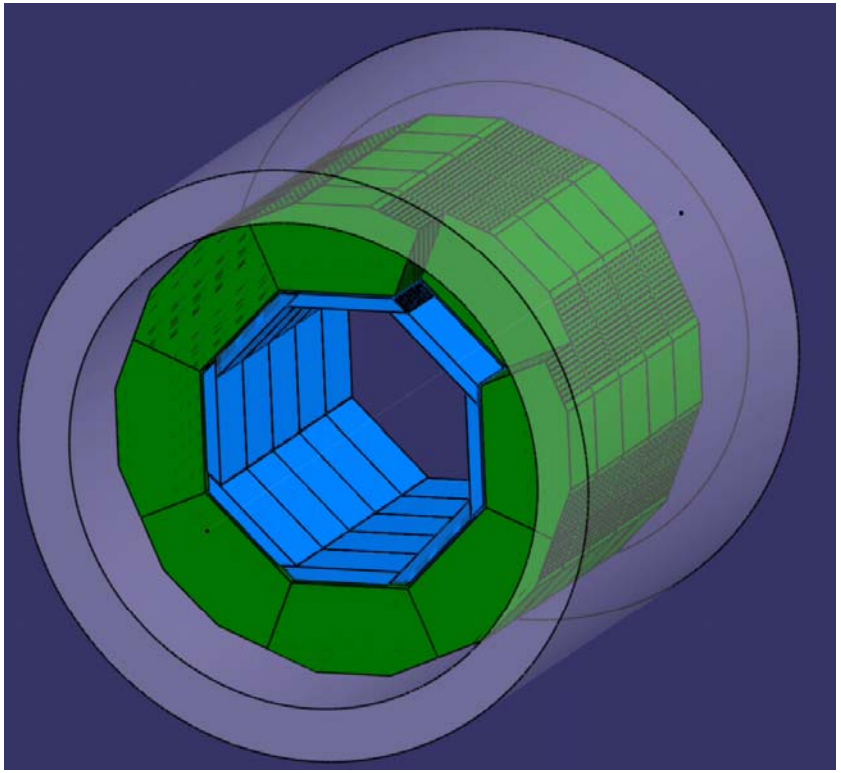
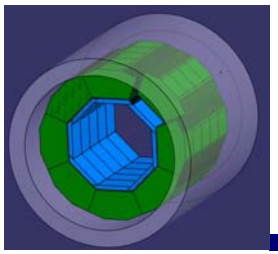


Calorimetry test beam

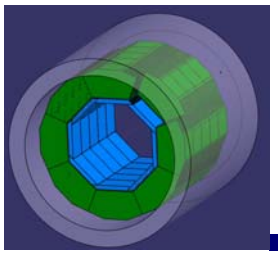
Felix Sefkow

LCWS07, Hamburg, June, 2007



Calorimeter needs

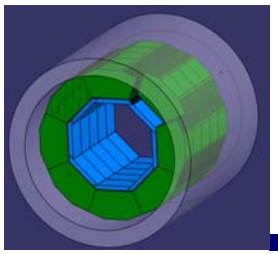
- Wide energy range: 1-100 GeV
- Wide range of particle types: e, μ, π, p (K, n)
- Large statistics
  - For reasons above
  - To study tails
- Eventually: ILC-like beam structure



Previous efforts

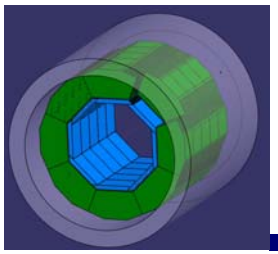
- CALICE took data at DESY
  - SiW ECAL, ScW ECAL, Sc Fe HCAL commissioning
- at CERN
  - ScW ECAL + Sc Fe HCAL+TCMT
- at FNAL
  - TCMT commissioning, RPC slice tests
- and elsewhere
  - RPCs at Protvino, GEMs in Korea, …

- Other activities:
  - DREAM at CERN



Observations

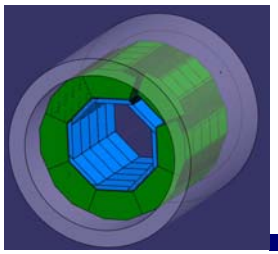
- Competition with LHC groups
- Next: competition with SLHC groups
- Competition with Silicon vertexing groups
  - From (S)LHC
  - From ILC (!)
  - They need higher energies (> 100 GeV) (!)
  - We need (high and) also lower energies (PFLOW)
- Do not forget the need of smaller facilities for commissioning an hardware testing
  - Should not interfere with "physics runs"



Future plans

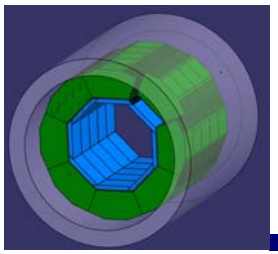
- CALICE:
  - CERN 2007:
    - SiW ECAL + ScFe HCAL+TCMT complete, angle scans
  - FNAL 2008:
    - extend to lower momenta (1 GeV), p-ID
    - All scintillator run: ScW ECAL + ScFe HCAL+TCMT
    - SiW ECAL + RPC-Fe HCAL
  - FNAL 2009:
    - Exchange (some) RPCs against GEMs
    - Exchange Fe against Pb (with Scint)
    - Scint with time-resolved electronics
  - To be scheduled
    - SiD ECAL with CALICE HCALs
- DREAM
  - To be scheduled

3 months each



Tagged neutrals

- Possibility to obtain momentum-tagged neutral particles @ MIPP
- Questions to be addressed:
  - Practical: how long do we need to run?
    - Cannot trigger on neutrals, but only tag offline
    - Purity is small
    - DAQ rate limited: instantaneous, average, buffer depth, spill structure
  - Conceptual:
    - High granularity data will provide detailed diagnostics on shortcomings o simulations (em part, neutron part, correlations,…)
    - Is it really possible to get the simulation of shower development right for piosn and protons – and wrog for kaons and neutrons?



Goals

- Particle flow and detector optimization:
  - Validate or reject models, narrow model-induced systematic uncertainties
  - Tune the simulations?
  - We do have contact to GEANT4 represenatives. But:
    - There are data from the 980s which are not properly modeled
  - Personal remark: if we commit ourselves that we need to ***tune*** the simulations in order to optimize and design the detector, we may not be ready even if Orbach's oracles come true…