Costruction and Test of a new E.M. Calorimeter for a futur Linear Collider

- Padova
- LNF
- help from DESY

Requirements for ECAL in TDR di TESLA (LINEAR COLLIDER):

- high granularity,(Energy Flow)
- σ_E O($10\%/\sqrt{E}$ $+1\%$)
- longitudinal segment. (e/π) separation,
- working in magnetic field
- high density (25-30 X_0 in $\sim$ 50 cm)

Solutions in TDR:

- Shashlik (thanx to CALEIDO)
- Si W (Cost ??? 35 Mchann.???)

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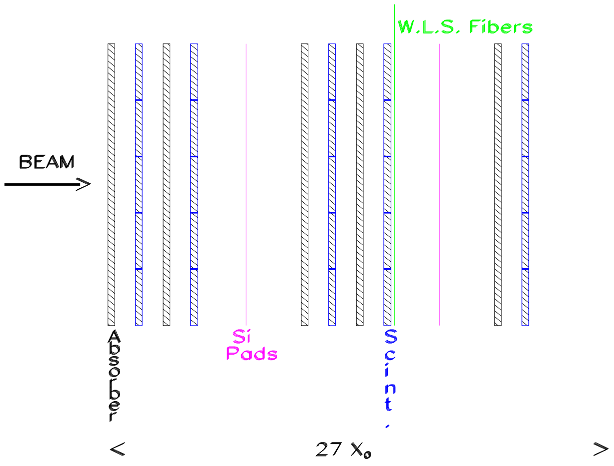
New Solution

Keep Si W advantages:

- *flat* geometry (pointing *software*)
- optimal shower-shower separation

Prototype Pb/Sc + Si:



- 50 layers:
- $25 \times 25 \times 0.3$ cm^3 Pb
- $25 \times 25 \times 0.3$ cm^3 Scint.: 25 Cells 5×5 cm^2
- 3 planes:
- 625 1×1 cm^2 Si Pads
- at: 2, 6, 12 X_0

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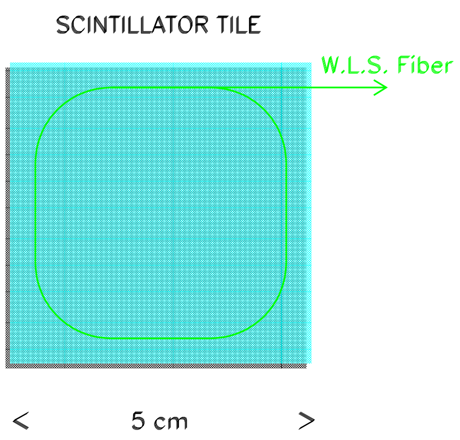
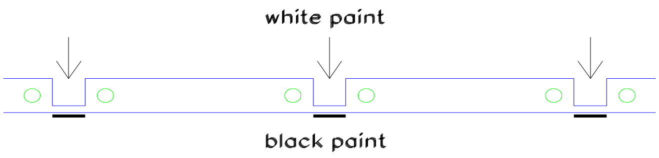
Scintillation light transported with fibers: WLS σ *tail*



Optimize:

- curvature radius
- response omogeneity
- coupling with clear fibers
- cells separation (i.e.)



R-O with PM, Tetrods, APD, ...

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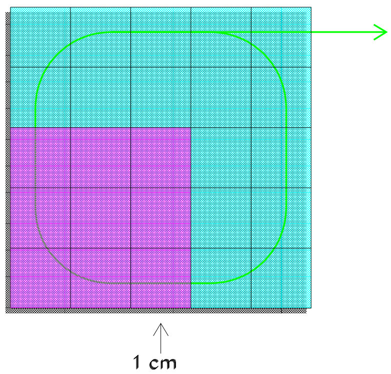
SI Planes



Goal: shower-shower separation

- Lateral dimension $\leq$dimension of shw.)
  1×1 cm^2
- Longitudinal sampling
  3 planes
- Analogic R-O
  Viking System (not yet available)
- Shower dimension reduction
  Tungsten absorber (2002)

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2000

- Submitted as R&D project at DESY

2001 Program

- Module construction
  ottimizzazione Fiber optimization:
  PD+LNF
  Si mounting: PD
  Calorimeter mounting: LNF
  Milestone: June
- Test su fascio
  low energy ($\sim$1 GeV: LNF
  high energy DESY+CERN
  Milestone: December

2002 program

- Additional beam tests
- W Absorber
- Data analysis

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