

# GROUP 5 : DETECTOR ISSUES

IN VIEW OF  $e-\gamma$  BACKGROUNDS AT SMALL RADIUS  
BETHE-HEITLER MUONS " LARGE "

## ① GENERIC DETECTOR CONFIGURATION (D. ANDERSON)

PHYSICS LARGE<sub>CM</sub> CENTRAL  $\Rightarrow$  SOLENOID MAGNET

SI VERTEX DETECTOR W/ PIXELS

GAS TRACKER : TPC

EM/HADRON CALORIMETER : LAr OR SCINT-TILE  
OUTER MUON CHAMBERS

## ② SURVIVE THE B-H MUONS IN THE CALORIMETER

$\Rightarrow$  VERY FINE SEGMENTATION IN  $x-y-z-t$  (ANDERSON, BERNSTEIN, KING, WINN..)

B-H MUONS 1-5 NS EARLY  $\perp$  || TO BEAM (STUMER)

ACTIVE DEBATE ON TECHNOLOGY OF FAST-TIMING CALOR.

## ③ SURVIVE THE SOFT $e-\gamma$ SPLASH IN THE SI-VERTEX DETECTOR

DOUBLE LAYER OF PIXELS (AP<sub>0</sub> 2MM) EFFECTIVE

AT PRESENT ESTIMATES OF  $e-\gamma$  FLUX AT 2x2 TEV (LEBRUN)

## ④ PHYSICS OPPORTUNITY : $\mu\mu \rightarrow \mu\mu X$ , PARTICULARLY $X = h^0, H^0, A^0$

VIA TAGGING OF FORWARD MUONS. (RASA, KING)

- HIGH-RESOLUTION TAGGING SOMEWHAT INCOMPATIBLE WITH SHIELDING AGAINST SOFT  $e-\gamma$ 'S.

## ⑤ PHYSICS OPPORTUNITY : $\nu$ BEAMS FROM STRAIGHT SECTIONS. (KIL)

AT 2x2 TEV,  $\sim 100 \nu$  INTERACTIONS / SEC IN 1 KG TARGET

$\Rightarrow$  MUCH IMPROVED MEASUREMENTS OF STRUCTURE FUNCTIONS,

$N_S, \sin^2 \theta_W, |V_{ub}|, \nu$  MIXING ...

" IF YOU BUILD IT, THEY WILL COME. "

## PRE-GILMAN ISSUES:

- $\gamma$  FLUXES AT 100-500 GeV (MORRIS)
- $e$ - $\gamma$  FLUXES IN NEW LATTICE AT ONE  
LOWER ENERGY (STUMER)

## LONGER TERM:

EXTEND DETECTOR SIMULATION TO INCLUDE

BENCHMARK PROCESSES:

$\mu\mu \rightarrow h^0$

$\rightarrow$  SUSY PAIRS

$\rightarrow$  WW

## DETECTOR R&D

- SUCCESS WILL DEPEND ON ADVANCES IN Si-PIXELS  
AND IN CALORIMETRY
- PROGRESS PRESENTLY DRIVEN BY LHC.
- FOR TIME BEING, MAINTAIN CONTACTS WITH  
EXISTING R&D PROJECTS RELEVANT TO  
THE MUON COLLIDER DETECTOR.