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COLD SE DETECTOR

AS LUMINOSITY MONITOR

① RADIATION HARDNESS

OPERATION POSSIBLE UP TO

$$\Phi_{\max} = 2 \cdot 10^{15} \text{ n/cm}^2$$

RATE AT 16 m FROM IP,
20 mm FROM BEAM

$$\dot{\Phi} = 10^8 \text{ cm}^{-2} \text{ s}^{-1} \quad (\text{TOTEM Prop.})$$

$$\textcircled{2} \mathcal{L} = 2 \cdot 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$$

⇒ LIFETIME

$$t_{\text{exp}} = \frac{\Phi_{\max}}{\dot{\Phi}} = 2 \cdot 10^7 \text{ s} = 231 \text{ d}$$

② LINEARITY

CALIBRATION AT $\mathcal{L} = 10^{28} \text{ cm}^{-2} \text{ s}^{-1}$

OPERATION AT $\mathcal{L} \leq 2 \cdot 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$

⇒ DYNAMIC RANGE OF 6 ORDERS
OF MAGNITUDE REQUIRED

- LINEARITY OVER 10^6 HAS BEEN TESTED
USING Pb BEAM AT SPS (ALSO WITH p)
- PROTON TEST WILL TAKE PLACE IN
MAY 1999

③ TIME AND POSITION RESOLUTION

MOBILITY INCREASES AT LOW TEMPERATURE

⇒ SIGNAL PEAKING TIME BELOW 5 ns
IS POSSIBLE

⇒ BUNCH-BY-BUNCH MEASUREMENT
OF L IS POSSIBLE

SEGMENTED DEVICES HAVE BEEN
TESTED AT 80 K

⇒ MICROSTRIP DETECTOR POSITION
RESOLUTION CAN BE PRESERVED

⇒ PIXEL DETECTORS OPERATED
AT TEMPERATURE OF 80 K

④ SENSITIVITY TO FIELD, TEMPERATURE, LIGHT etc.

LOW MAGNETIC FIELDS : OK

TEMPERATURE : STABILIZED, LOW SENS.

LIGHT : CANNOT OPERATE IN BEAM PIPE