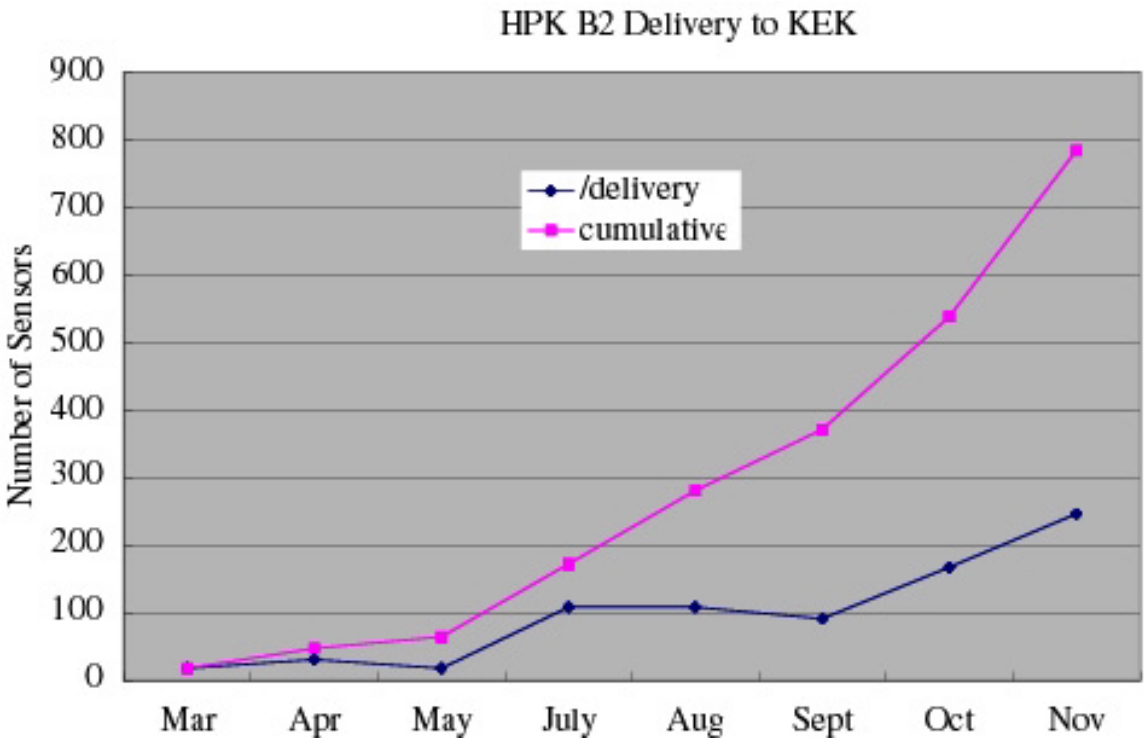
Status of detector production and Irradiation test of baby detectors

K. Hara (U Tsukuba)



6.3 Data supplied by the manufacturer (from Detector FDR)

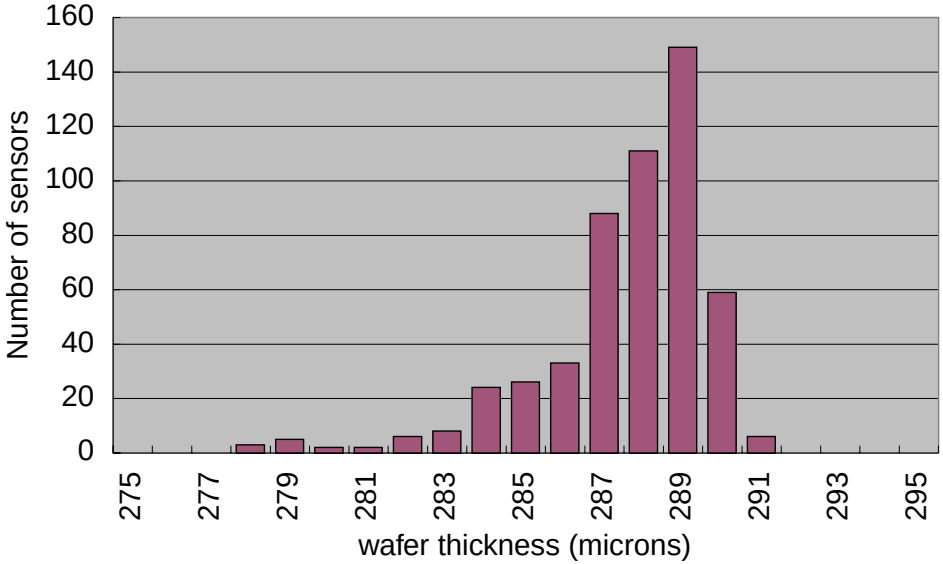
- The detector serial number and identification number
- Detector type (B1,B2,W12,…)
- Detector thickness
- Substrate description (origin, orientation, approx. resistivity)
- IV data up to 350V bias, including the value of the current at 150V and 350V
- Temperature of IV measurement
- List of strip numbers of oxide pinholes with 100V across the oxide
- List of strip numbers with strip metal discontinuities
- List of strip metal shorts to neighbours
- Depletion voltage (usually measured by the manufacturer using a diode)
- Polysilicon bias resistancxe range of the processed batch

Acceptance tests by ATLAS Institutes

- Tests on every detector: visual inspection* and IV curve
- Tests on detector subsets:

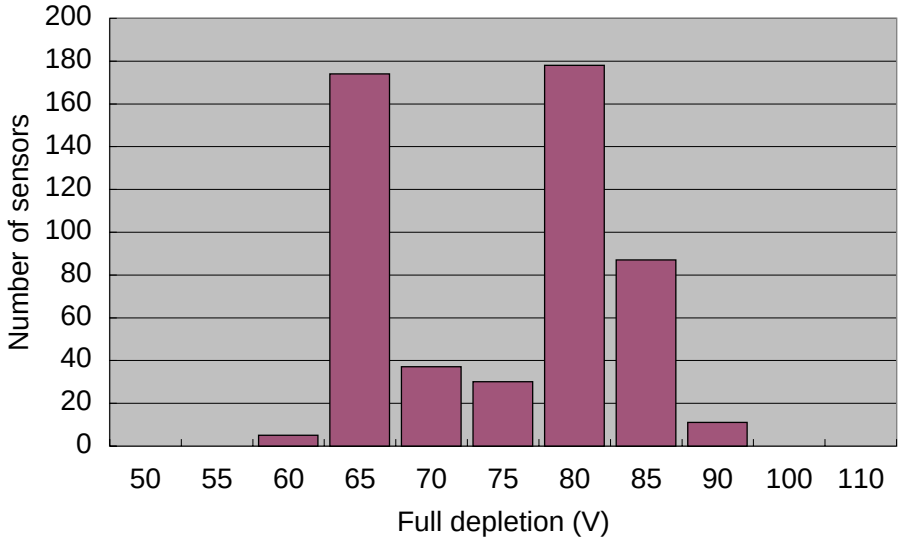
  CV curve, strip integrity (to check manufacturer data), I-stability for 24 hours,
  full strip test including implant strips, Rbias,

All the above tests are currently made at HPK or the manufacturer data are substituted

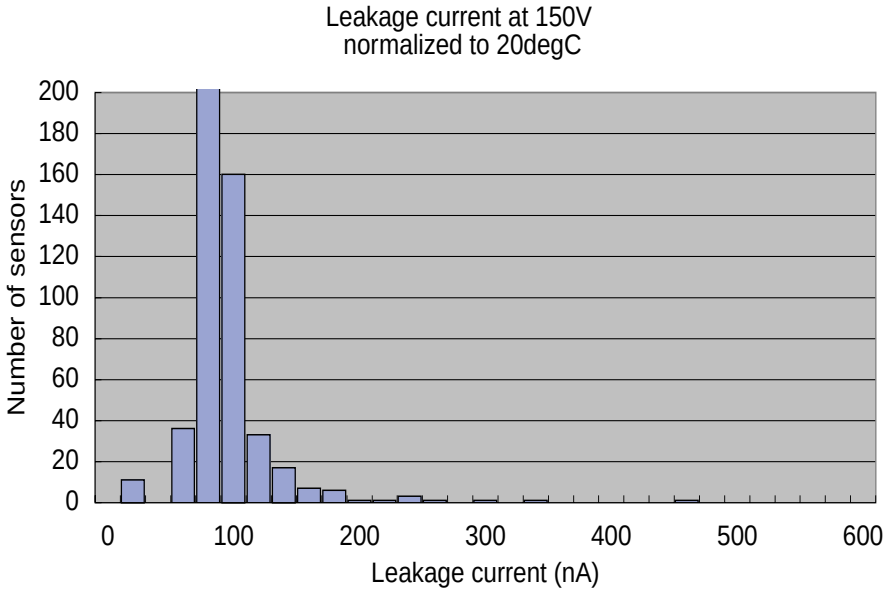


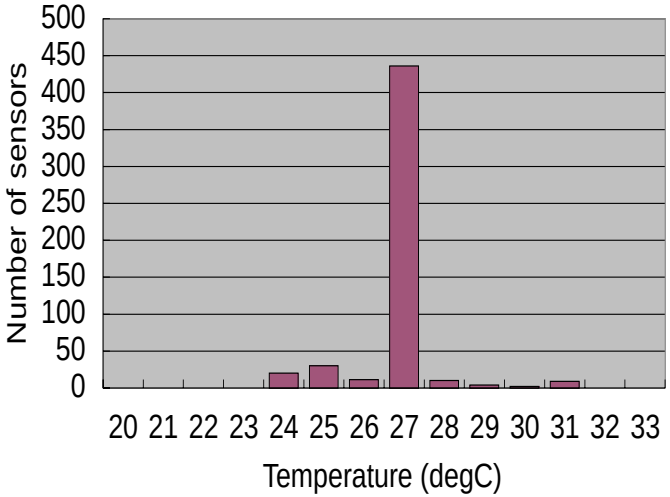
Some sample plots….

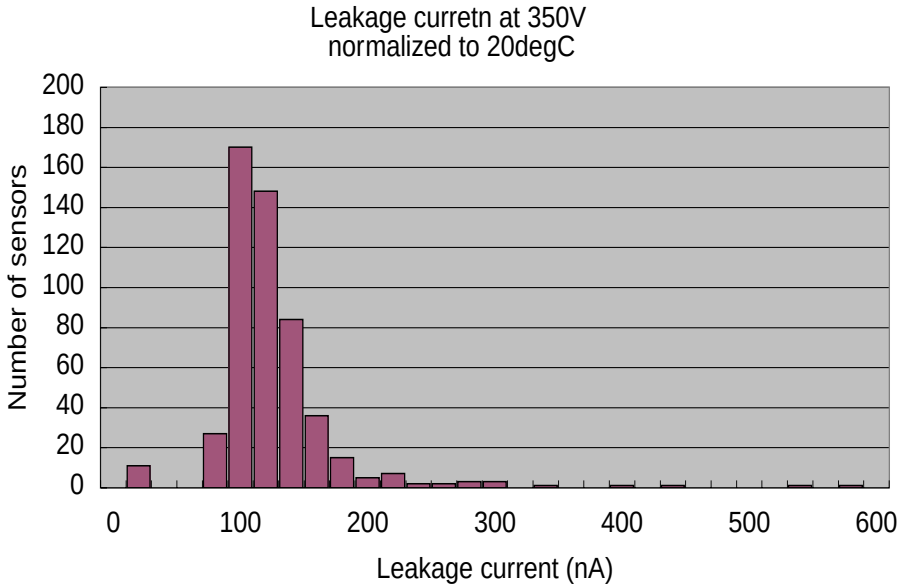
- Mean~288um (spec: 285+-15)
- Thinner ones < 283um are from recent deliveries



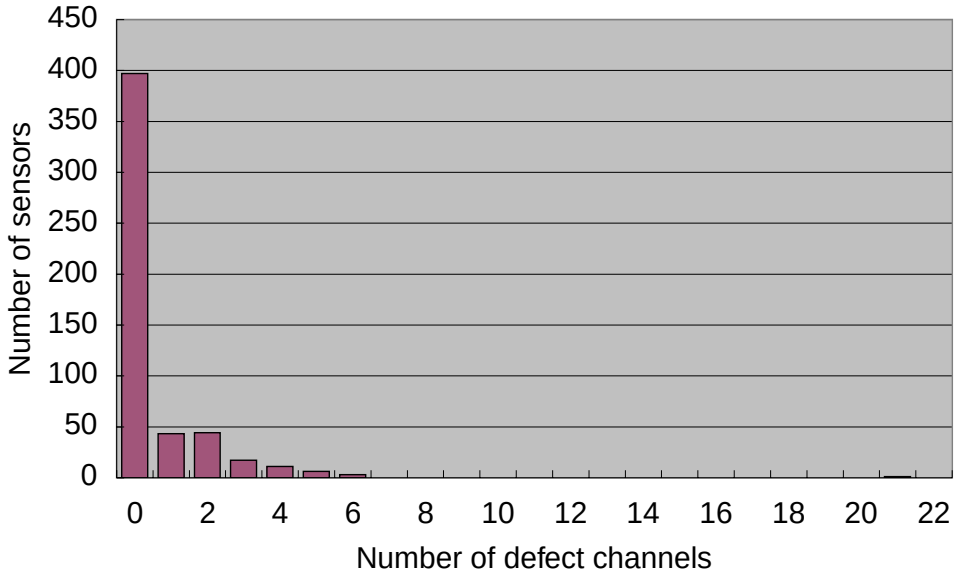
Vdep~65V are from recent deliveries

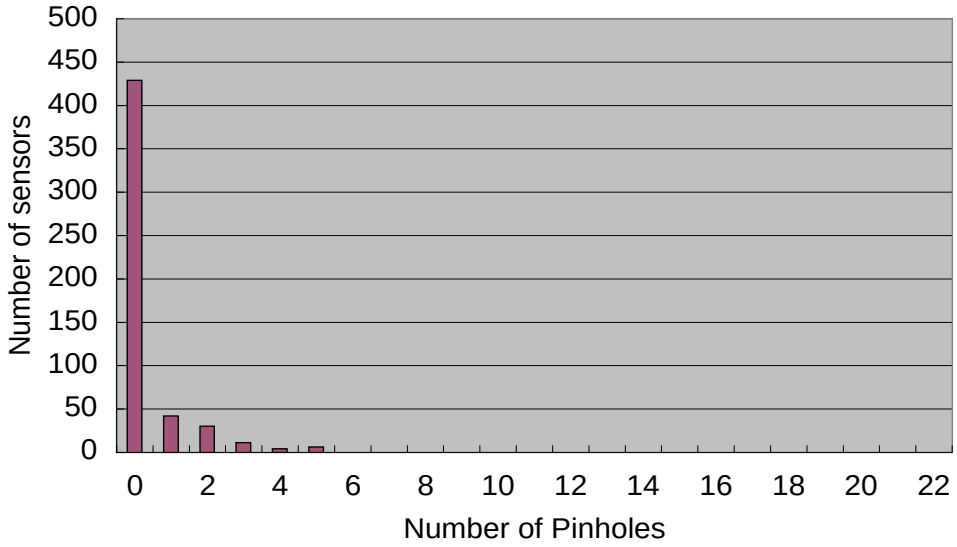




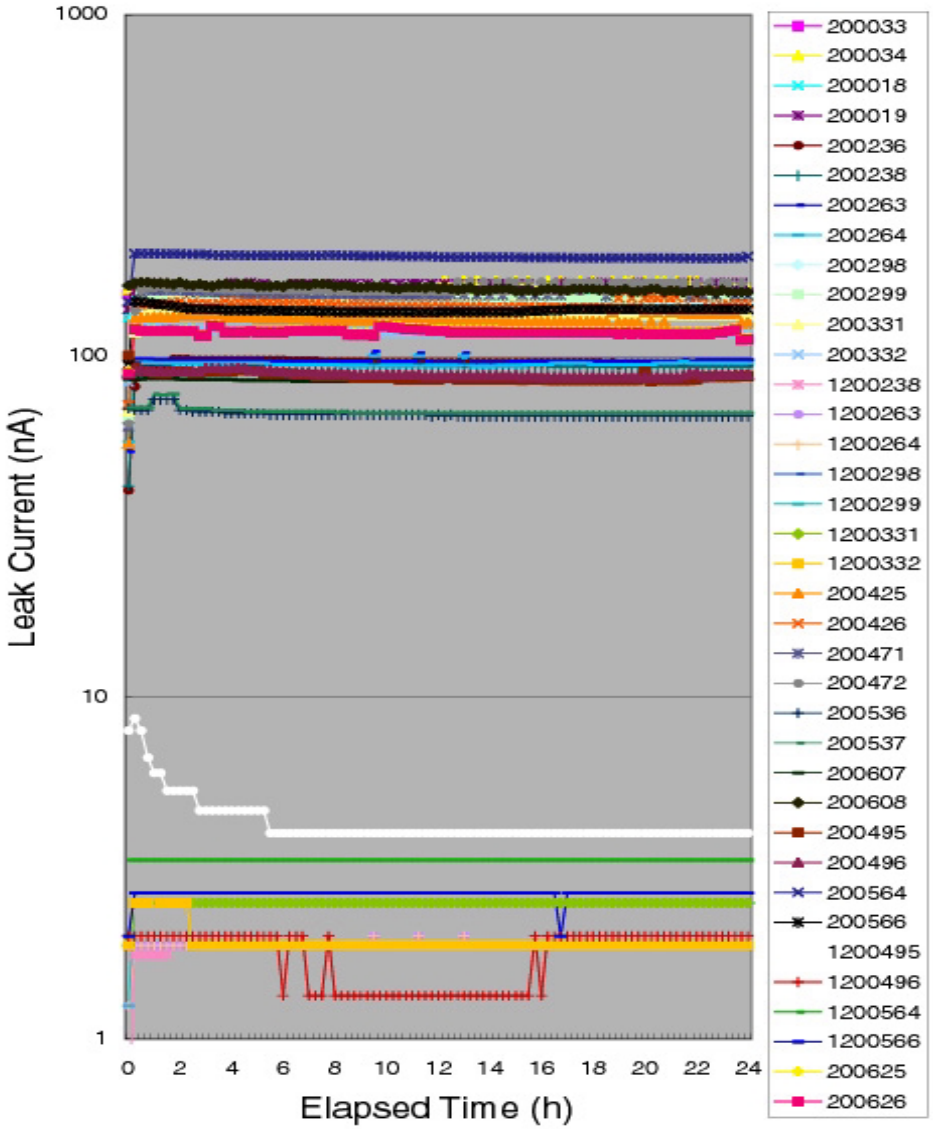


- Temperature well controlled to 27degC recently
- Leakage current shapes from recent delivery are similar to those from earlier (before Aug)



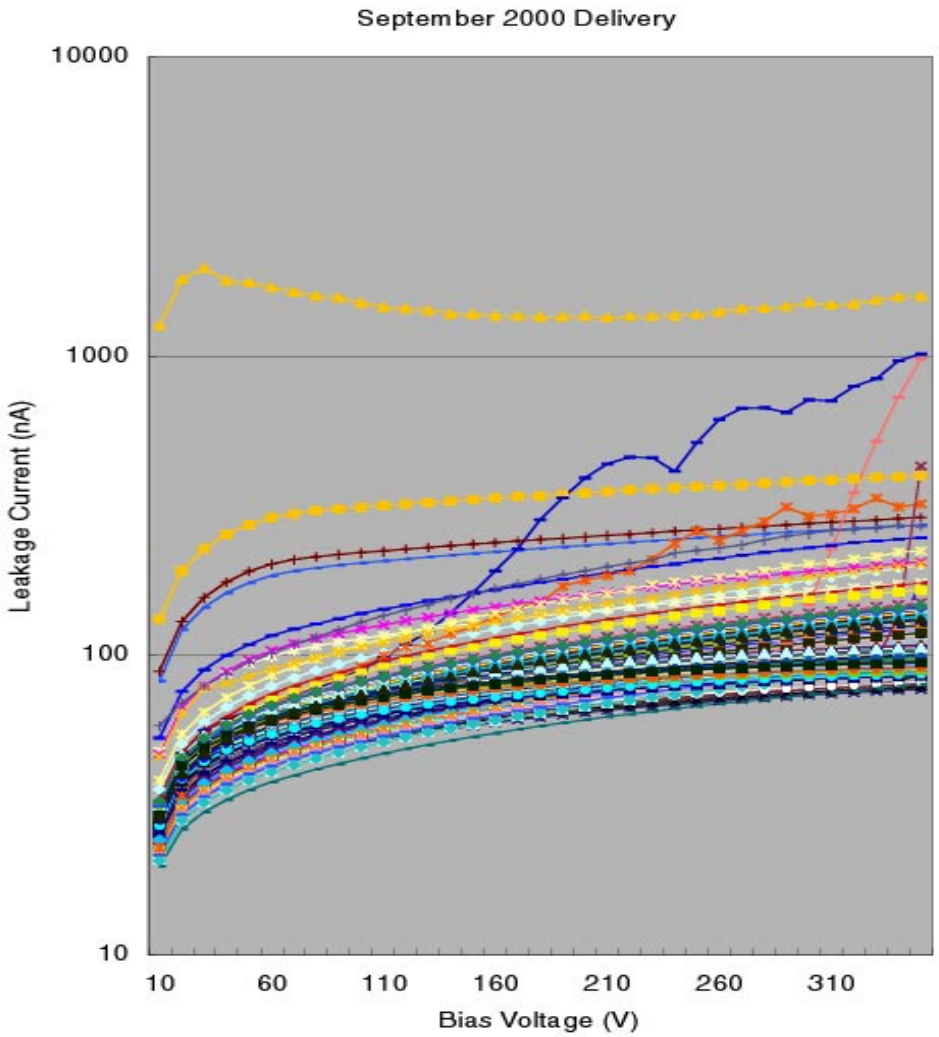


- Defect channel distribution of recent delivery is similar to those from earlier (before Aug)
- Largest contribution is pinholes



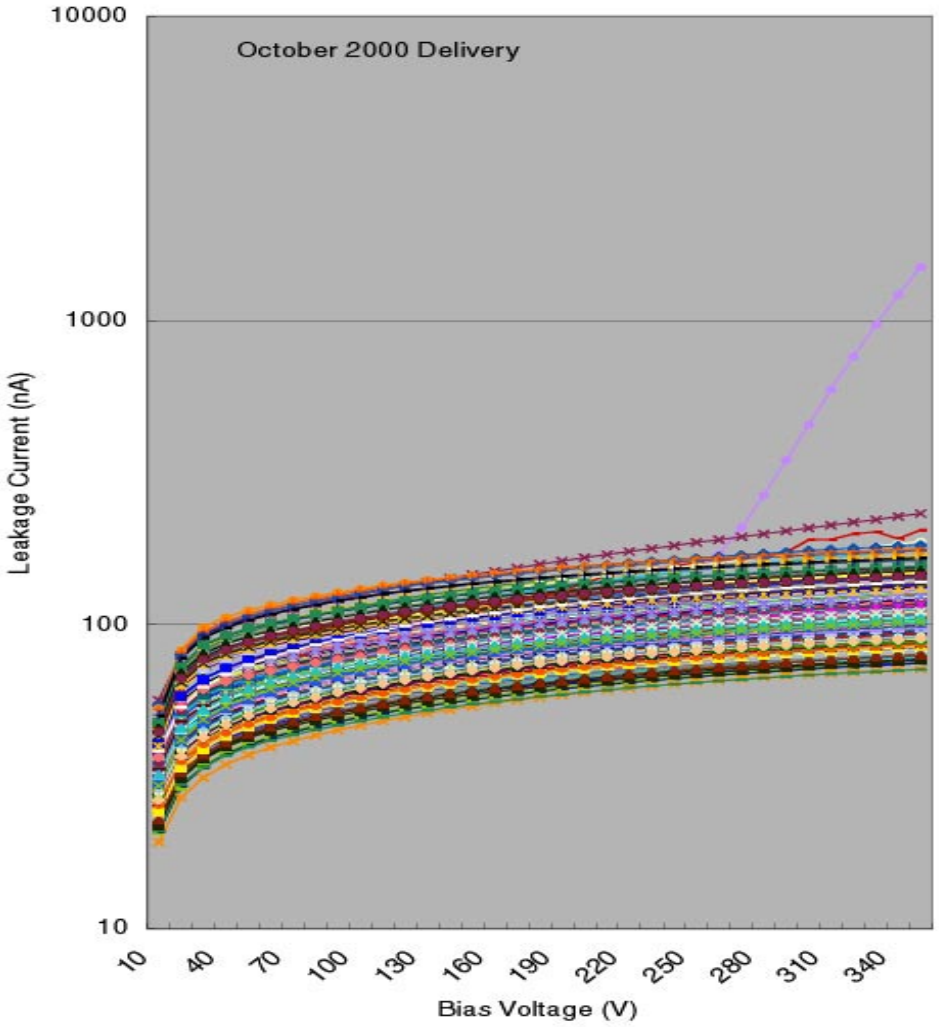
•I-stability for 24 hours

•Full size and baby detectors
(2 detectors/lot)



•I-V curves from September

•There are a few detector with funny shapes, which are supposed to be screened by HPK



•I-V curves from October

•There is just one detector with funny shape

⑥ Irradiation tests

major purpose: monitoring of (oxidation) process - Processing changes may affect post-irradiation performance which may not be apparent from pre-irradiation measurements

Samples:
- ○ 3baby detectors (1 × 1 cm^2) from each lot (lot=30~40 good sensors)
- ○ full size detectors from initial lots and at modifications in processing
- ○ some modules : using B-class sensors, if needed

Baby and full size detectors are glued on ceramic boards
Proton fluence: 3×10^{14} p/cm^2 (cf 1.4×10^{14} n/cm^2 in 10 LHC years)
Detectors are kept at -10°C

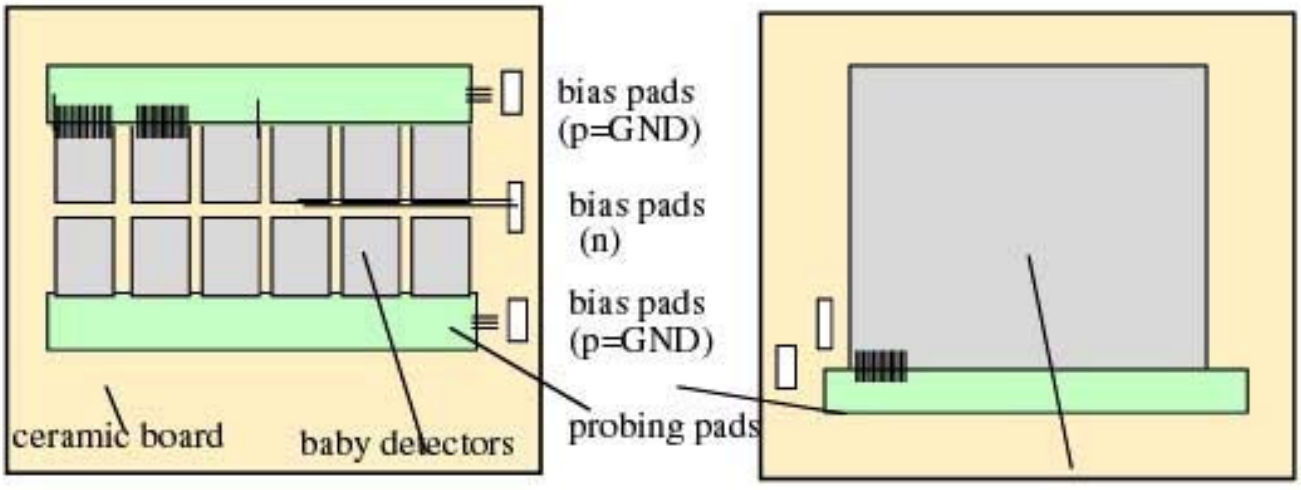
measurements:
I-V (I <1mA@350V and @-10°C)
C-V (Vb up to 350V and @-10°C)
Oxide puchthroughs (Ccp probing @RT)
Data run and Laser scan for full-size detectors and modules @-10°C
(w/ chips→noise, charge collection efficiency)

time estimates:

6000/(30lot) × (3/lot)/12

sample preparation: ~50 baby sets × (glue + w.b.) =150h=18d
~20?full-size detectors × (glue + w.b.) =60h=8d
~20? detectors × (chip mounting after irrad) =60h=8d

measurements: I-V and C-V 2hr/sample = 140h=17d × 2 (pre/post)
Ccp 2hr/sample = 140h=17d × 2 (pre/post)
Noise (data run) 2hr/sample = 40h=5d
Laser scan 3hr/sample = 60h=8d



15 December 2000

2001 PS Fixed Target Programme

DRAFT 0.3

Colour convention: purple (dark shading) = not yet allocated ; yellow (light shading) = not allocatable or Machine Development

		P1A	P1B		P2A	P2B	P2C		P3A	P3B
		29 2 Apr 2 May	32 2 May 4 Jun		23 11 Jun 4 Jul	27 4 Jul 1 Aug	25 1 Aug 27 Aug		28 3 Sep 1 Oct	35 1 Oct 5 Nov
t7	PS setup 7	LHCb Outer 14; LHC Irrad 8; [illegible] 6	LHCb IT RI 14; OPERA 14; LHC [illegible] 7		NA58 14; MICRO MEGA 7	LHC Irrad 16; [illegible] 7	OPERA 14; LHC Irrad 13; [illegible] 6		LHC Irrad 11; NA58 Si 12	OPERA 14; LHCb Outer 14; LHC Irrad 12
t8	PS setup 7	DIRAC test 7			DIRAC 126					DIRAC 45
t9	PS setup 7				HARP 203					
t10	PS setup 7	HMPID 8; TOF 13	PHOS 28; PMD 14		TOF 7; SDD 9; Muon 14	SSD 12; HMPID 7; TOF 7	PHOS 28		TOF 7; PMD 7; HMPID 7	SDD 14; MUON 9; TRD 12
t11	PS setup 7	LHCb Muon 23; NA58 Gem 7	RD42 7; free 7; [illegible] 7; NA58 SciFi 12		CMS RadMon 14; free 9	RD42 7; PHOTAG 14; NA58 SciFi 12	MINOS 42		[illegible] 7	AGILE 14; LHCb Muon 21