

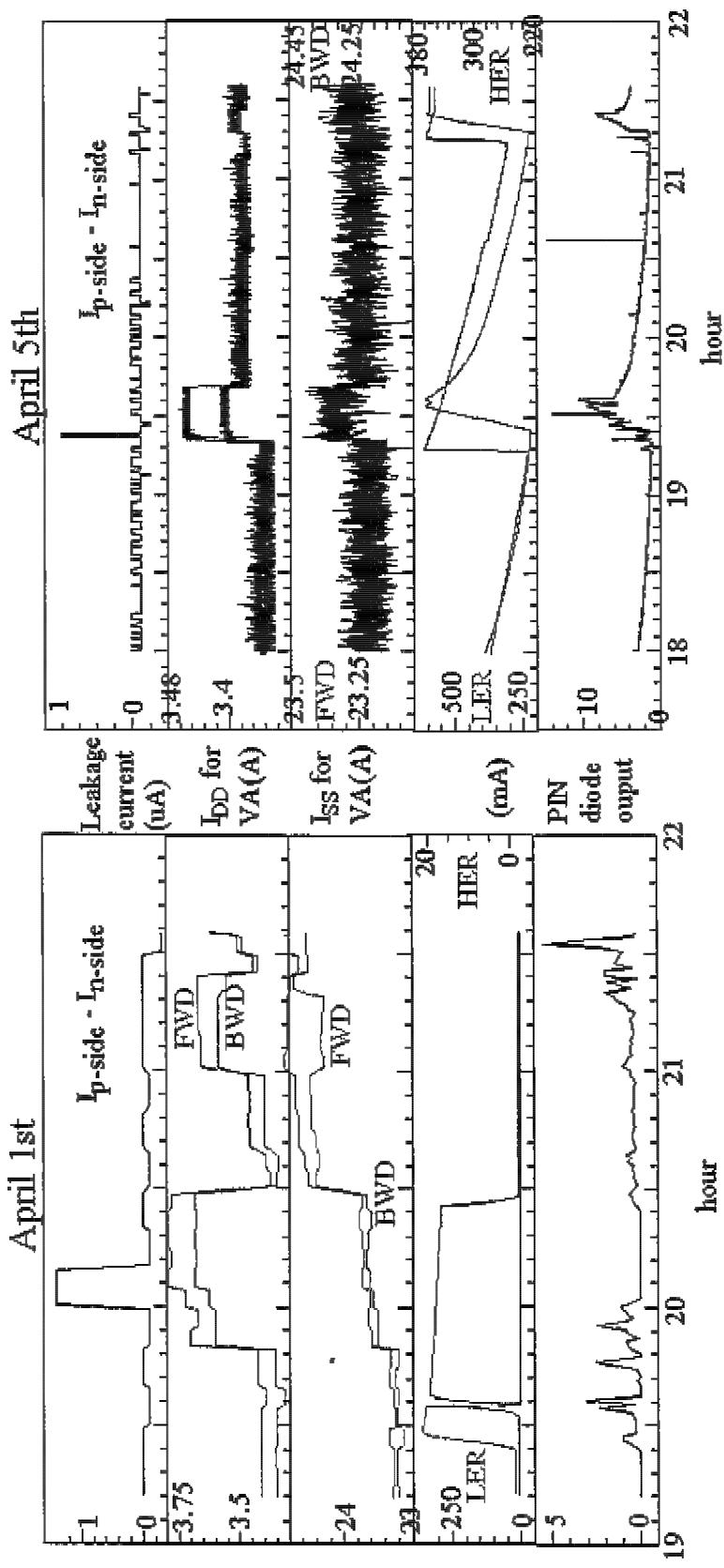
SVD accident investigation

- Status
 - Position/time dependence
 - Observable
 - Time dependence(I_{leakage} , I_{bias} ..)
 - Channel&position dependence(Gain ..)
- Hypothesis
 - Frontend circuit
 - DSSD position and particle mask

Manobu Tanaka

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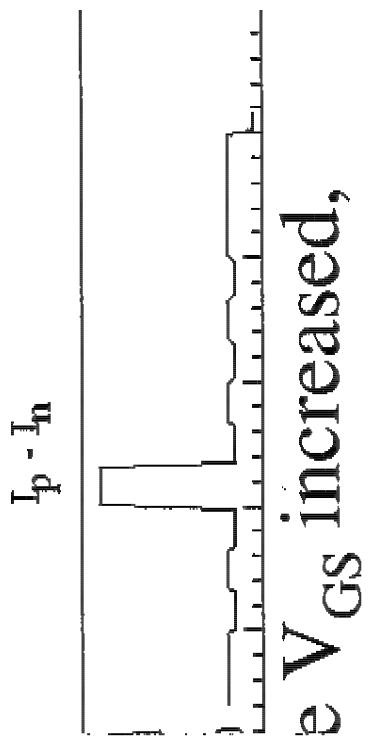
Time dependence



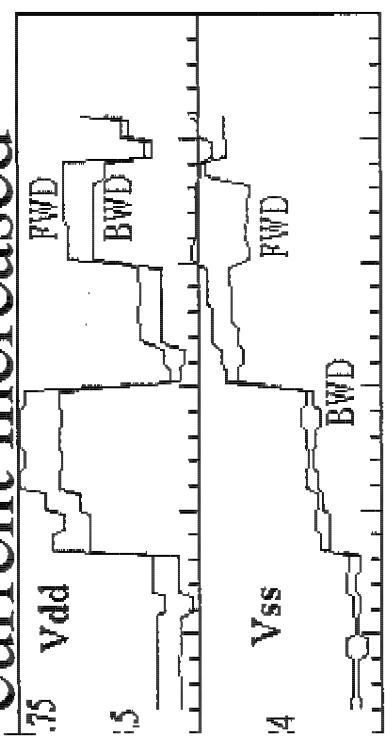
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Increase cont'd
Increase of V_{GS}

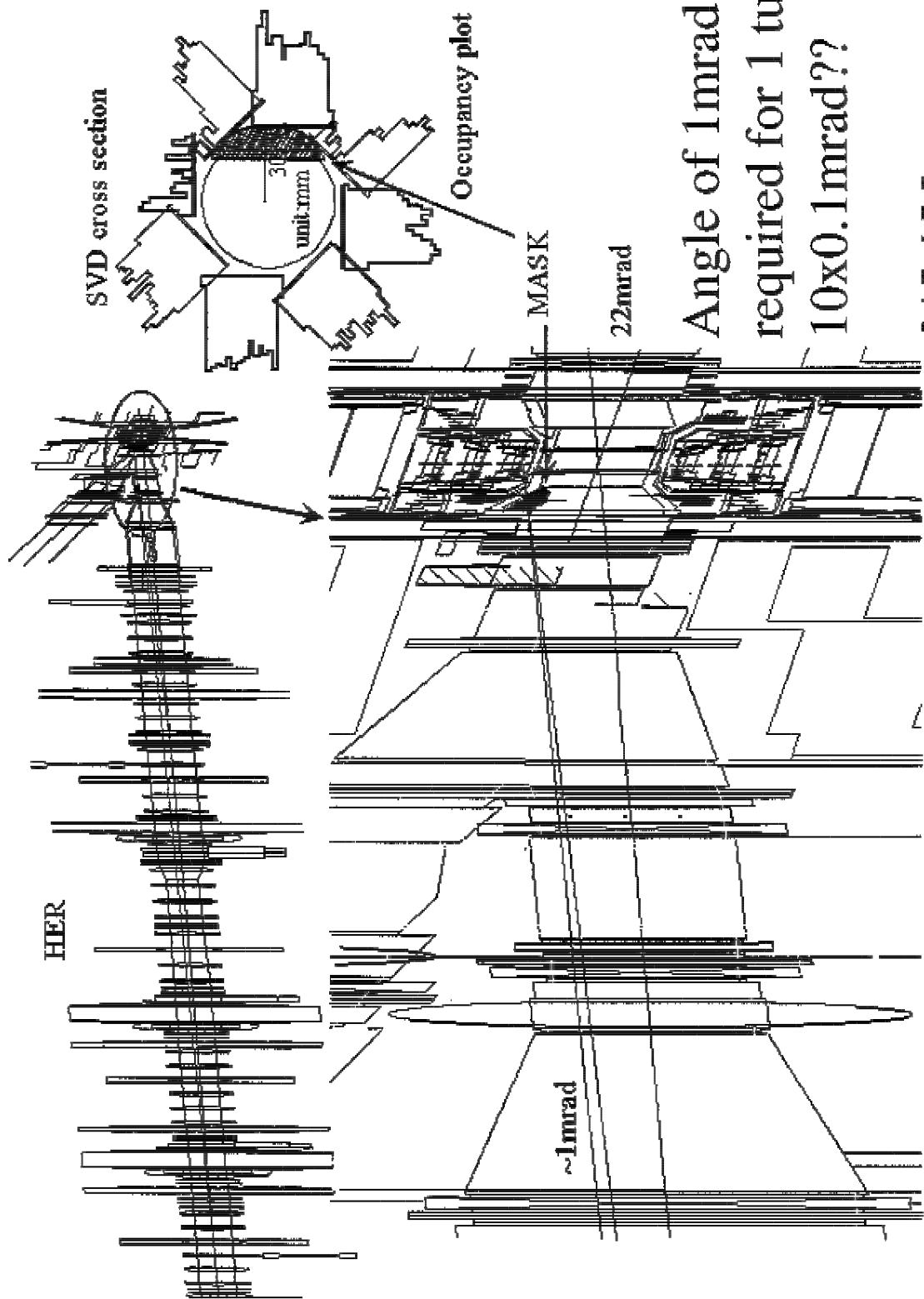


current increased,



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position dependence I (mask)



Angle of 1mrad is required for 1 turn.
10x0.1mrad???

SVU



4

life



Position/time dependence

- I observed two times, but 1st one should be different from another.
 - Malfunctioning VAs for 2nd accident are in one of malfunctioning hybrid.
- 1st layer and outer side of ring Top and bottom
 - Correlation:particle mask position
 - Correlation:Channel position in a VA and malfunctioning channels
- No saturation and no annealing effect
- Wrong values were set to two MGs, but kick angle was 0.1 mrad(small)

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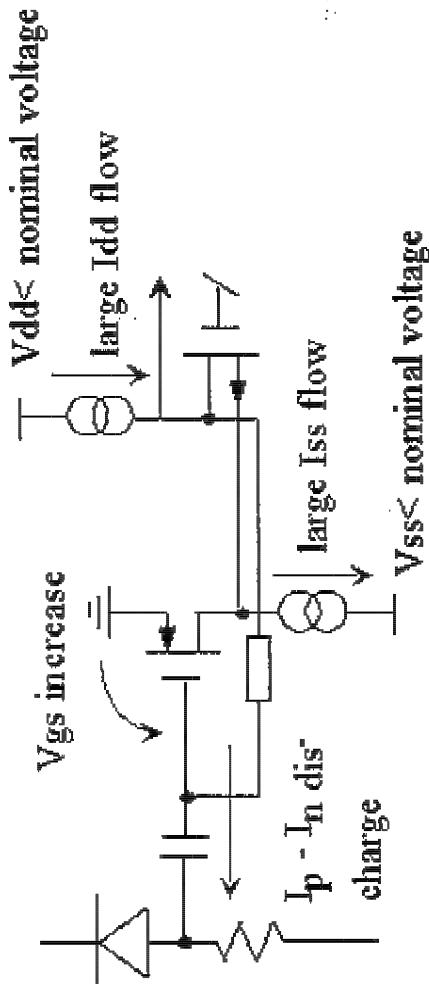
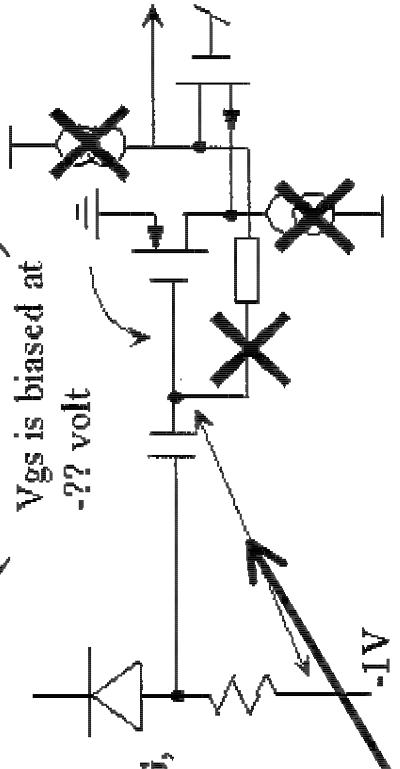


Hypothesis

- Two things happens at the same time
 - 1)Gate of input MOSFET was biased or 2)preamp was saturated by BG or Beam \rightarrow global position dependence
 - Drain voltage of the MOSFET became smaller than V_{GS} due to LV off and on $\rightarrow V_{GS}$:large negative \rightarrow Large current flow \rightarrow A bus line(V_{dd} , V_{ss}) was damaged \rightarrow substructure
- Why only hybrids connected to p-side? \rightarrow only p-side is biased negative
- Was LV turned off/on? \rightarrow see. Additional info.

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Hypothesis (cont'd)



Surface current from Al
trace of readout to Al trace
of p-side bias line
Or
Transient current of AC
coupling cap on DSSD
Or
VA saturation

- Input MOS was broken or power rail was damaged

SV0

Additional info

HV-monitor log on April 1st

HV/LV was off/on several times during injection.

14:55:56.0,	4/	1/100 (469000)	LV current log:	4.45,	4.46,	4.46,	3.35,	23.15,	3.38,	23.76	
15:44:36.0,	4/	1/100 (469500)	LV current log:	4.45,	4.45,	4.47,	4.46,	3.35,	23.20,	3.38,	23.75
16:33:11.0,	4/	1/100 (470000)	still alive								
16:33:17.0,	4/	1/100 (470000)	LV current log:	4.45,	4.44,	4.47,	4.45,	3.36,	23.16,	3.40,	23.72
17:21:57.0,	4/	1/100 (470500)	LV current log:	4.45,	4.45,	4.47,	4.45,	3.37,	23.16,	3.38,	23.74
18:10:38.0,	4/	1/100 (471000)	LV current log:	4.50,	4.47,	4.54,	4.51,	3.36,	23.21,	3.39,	23.73
18:50:17.0,	4/	1/100 (471408)	HV OFF CRATE:0&1,								
18:50:25.0,	4/	1/100 (471408)									
18:51: 4.0,	4/	1/100 (471408)	HV ON CRATE:0&1,								
18:51:22.0,	4/	1/100 (471408)	req=0x13648 (SEURESET) from SVD								
18:57:23.0,	4/	1/100 (471467)	transientmode ended								
19: 0:36.0,	4/	1/100 (471500)	LV current log:	4.47,	4.46,	4.46,	3.34,	23.23,	3.38,	23.69	
19:34:33.0,	4/	1/100 (471849)	HV OFF CRATE:0&1,								
19:34:41.0,	4/	1/100 (471849)									
19:35:20.0,	4/	1/100 (471849)	HV ON CRATE:0&1,								
19:35:38.0,	4/	1/100 (471849)	req=0x13648 (SEURESET) from SVD								
19:41:36.0,	4/	1/100 (471908)	transientmode ended								
19:50:34.0,	4/	1/100 (472000)	LV current log:	4.46,	4.39,	4.74,	4.62,	3.76,	23.72,	3.61,	23.99
20:26: 5.0,	4/	1/100 (472365)	HV OFF CRATE:0&1,								
20:26:13.0,	4/	1/100 (472365)									
20:26:52.0,	4/	1/100 (472365)	HV ON CRATE:0&1,								
20:27:10.0,	4/	1/100 (472365)	req=0x13648 (SEURESET) from SVD								

SVD

Conclusion

- Reduce large BBC
 - Preparation of a single path monitor
 - Establishment of KEK-B tuning for finding orbit... (almost finished)
- No automatic power on procedure during injection.(if power have been turned off by ABORT/SEU.)



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