BLADDER

SVD

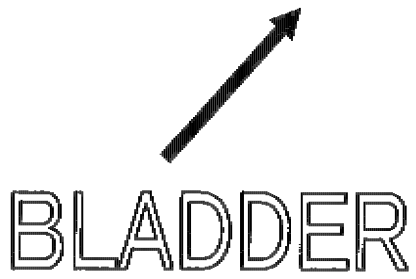
-To minimize effect of high beam BG-

-To minimize effect of rad damage-

-To find unpredictable trouble-

Manobu Tanaka

KEK



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Outline

- What is BLADDER
- What is important
- What we learned
- Conclusion

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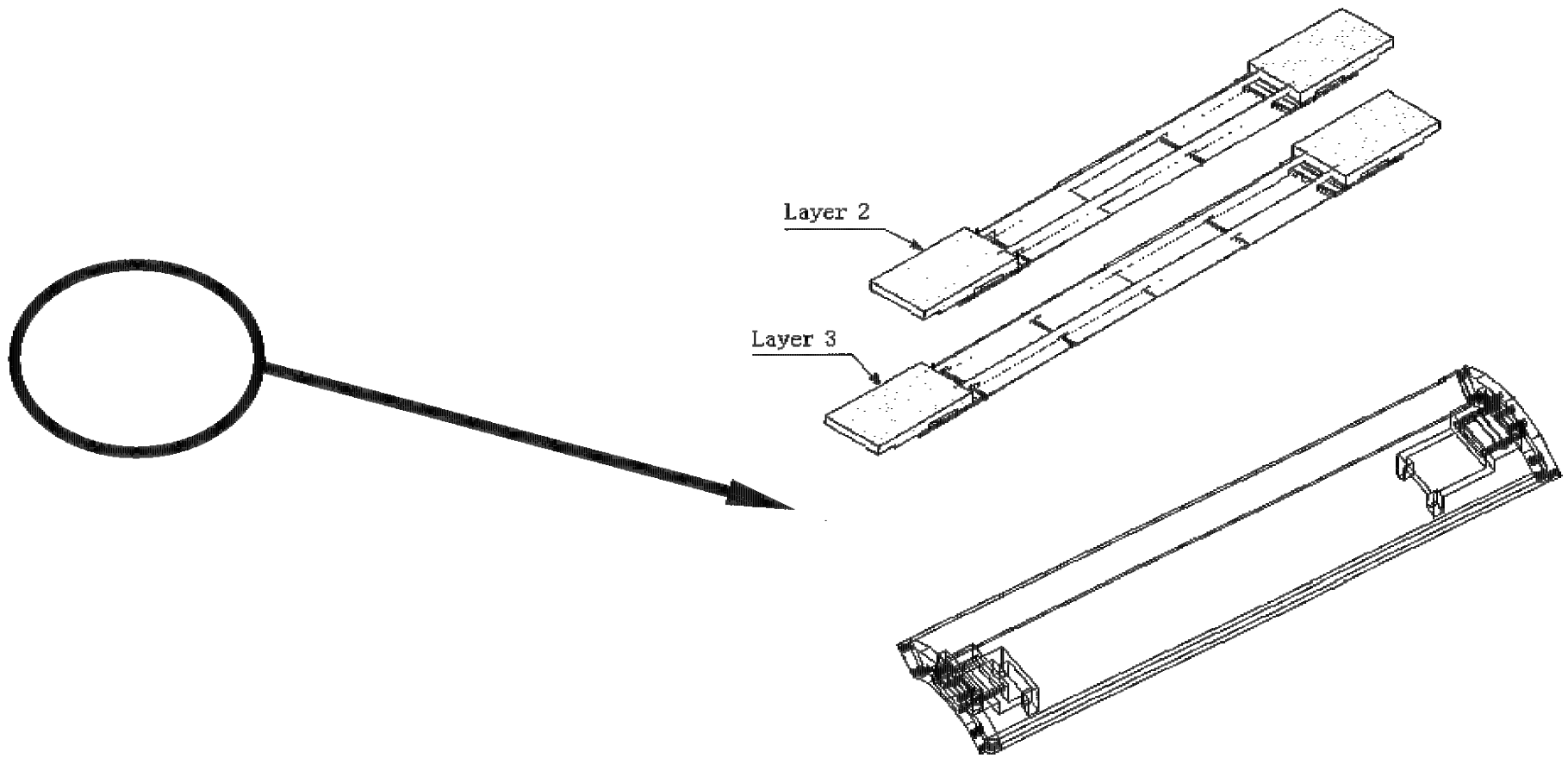
What is BLADDER

BLADDER SVD

- Inner bladder --> SVD 2nd layer(fw)
- Outer bladder --> SVD 3rd layer(fw)



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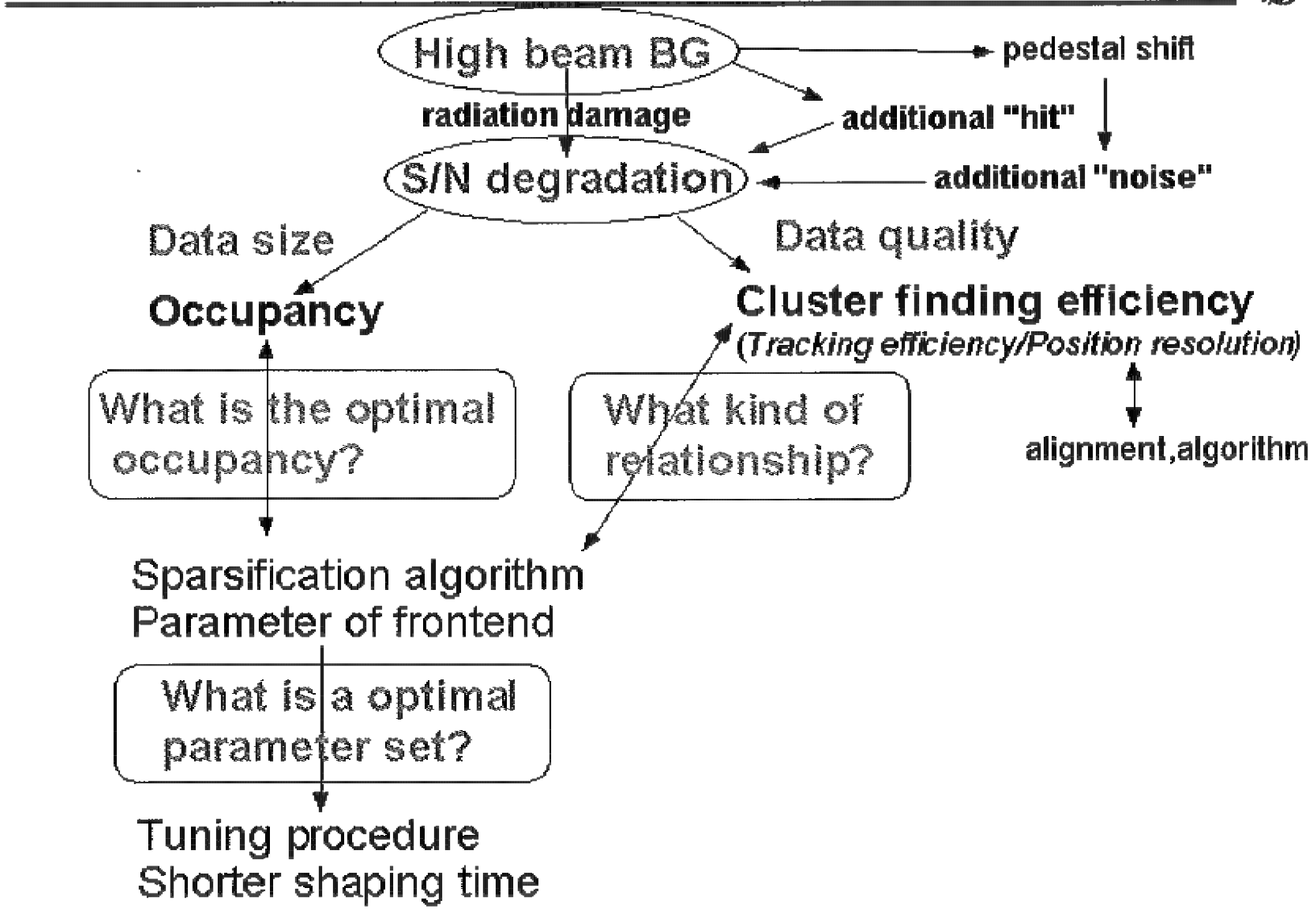
What is important?



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What is important?(cont'd)

SVD

- Influence on data size
  - ---> Hardware
    - (DAQ, online sparsification algorithm)
- influence on data quality
  - ---> Software
    - (cluster finding/tracking efficiency, algorithm)

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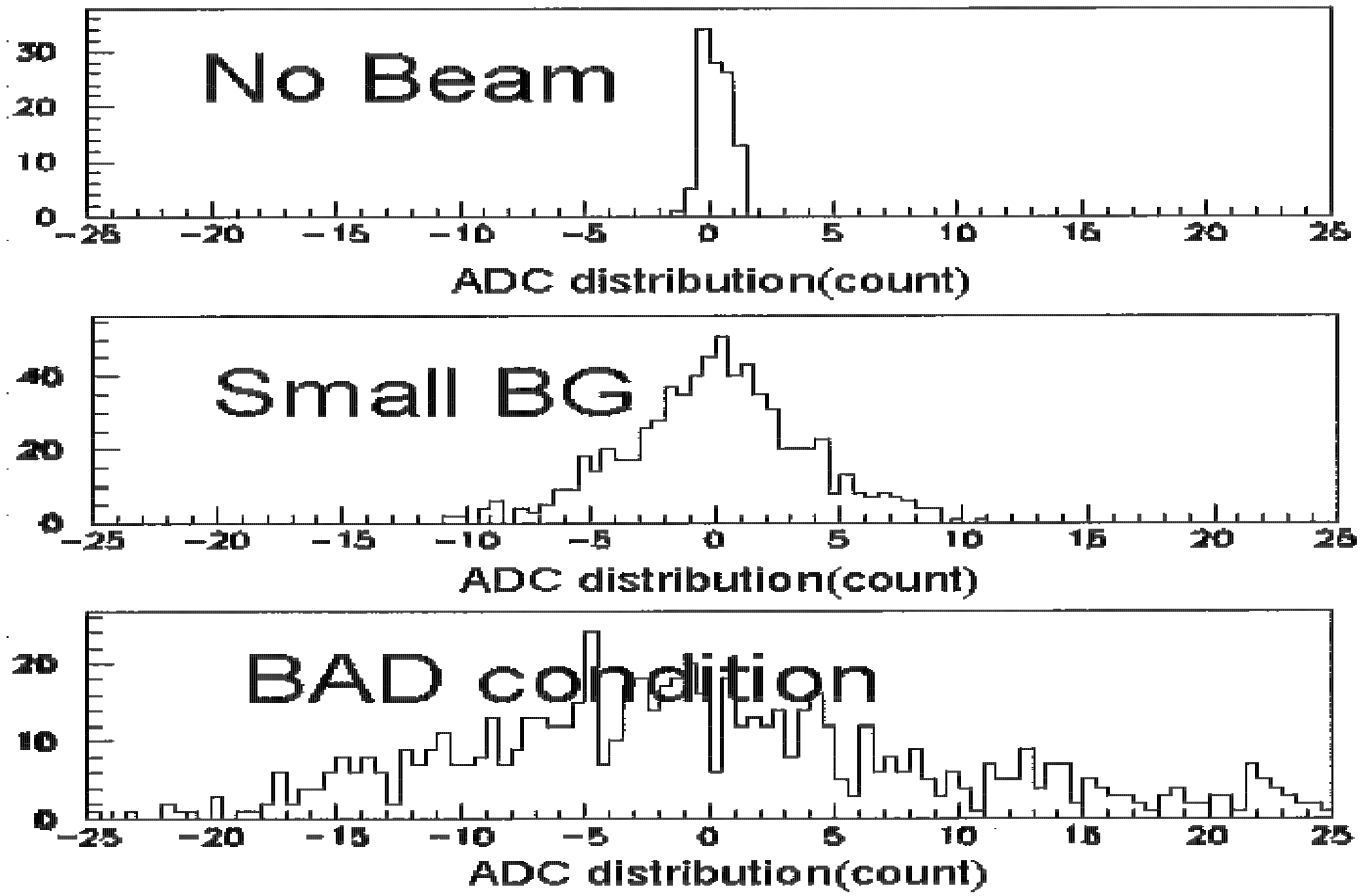
Noise(ADC) distribution

SVD

- Examples of noise distribution depends on KEK-B condition !! See. Fig



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Influence on data size

SVD

Basic parameters

* **almost consistent with result from another exp**

Δi_{leak} ~ 0.3nA/(strip*kRad)

Δgain ~ -20% ~40%(after 100kRad)

1/(S/N) ~ 0.3xDose(Rad)+0.045+from BBG

Occupancy

In order to avoid the unknown factor from beam BG.

shaping time dependence(see. Fig 1)

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Occupancy v.s. shaping time

SVD

- Sparsification algorithm(offline)
- Vaccum condition

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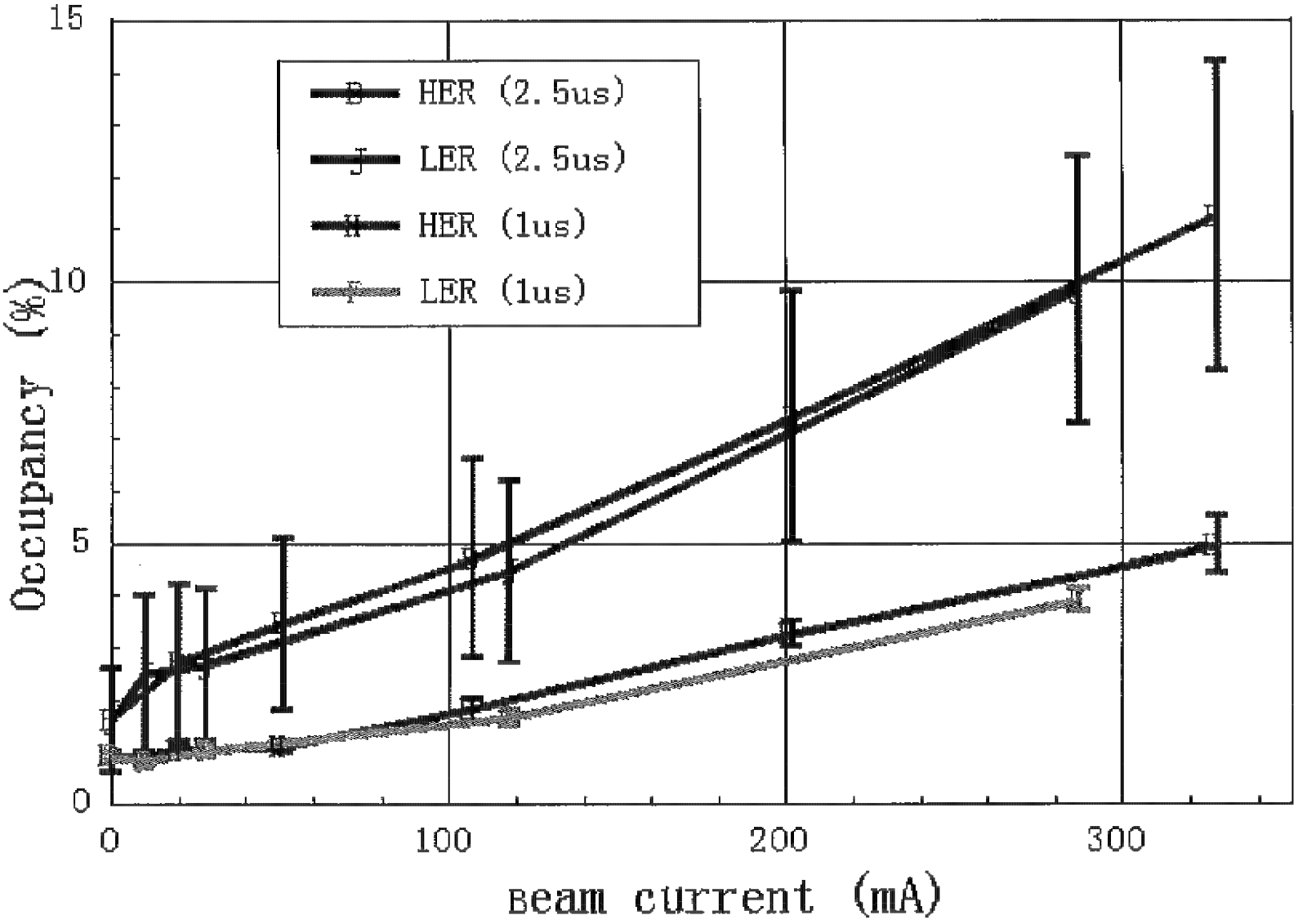
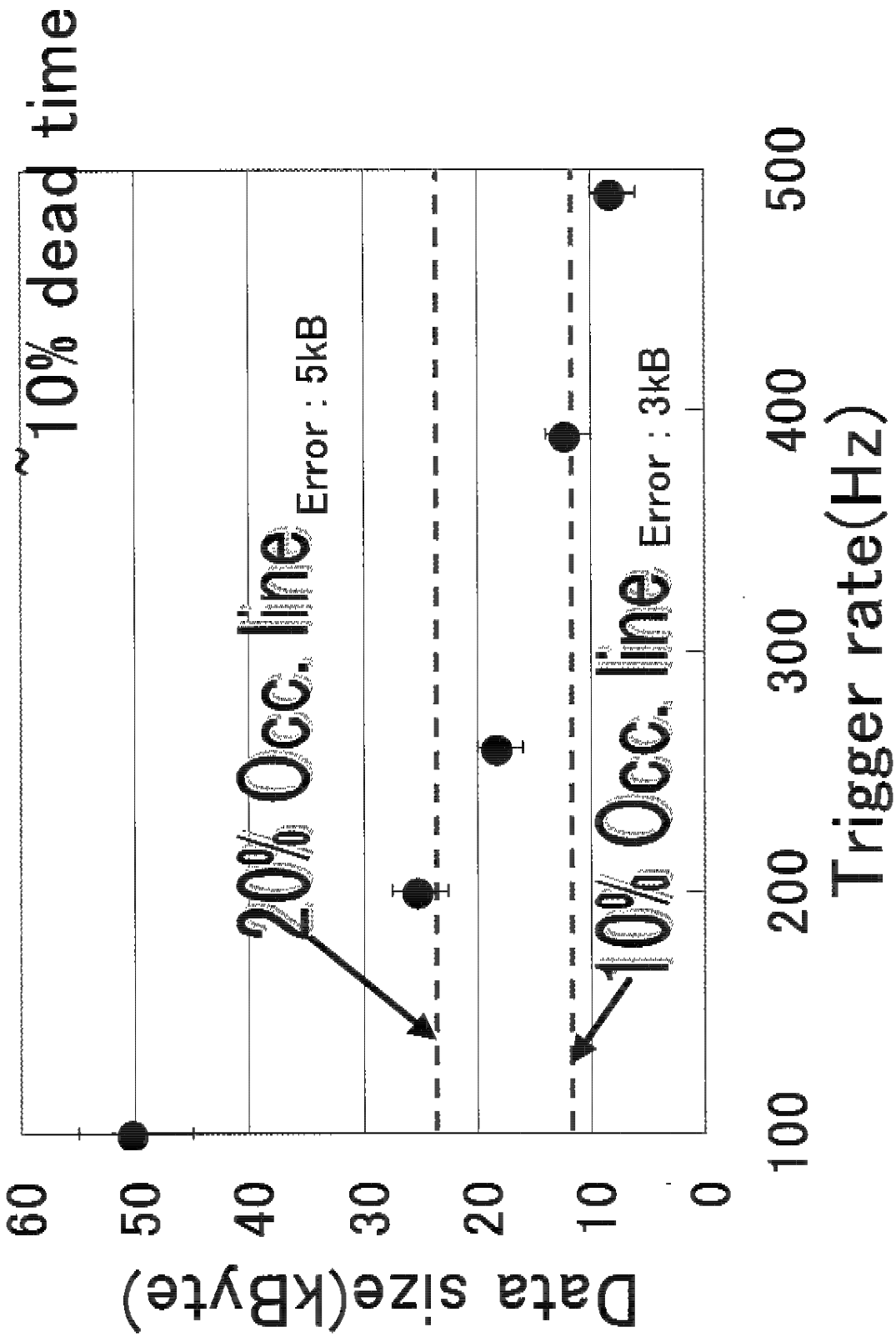
Occupancy v.s. shaping time



DAQ speed v.s. Data size

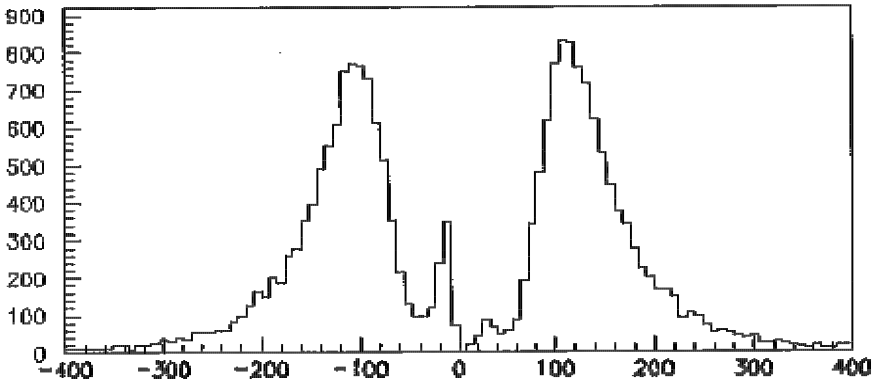


Influence on data quality

SVD

- Cluster finding efficiency (see. Fig 4)
  - *efficiency v.s. S/N or current*

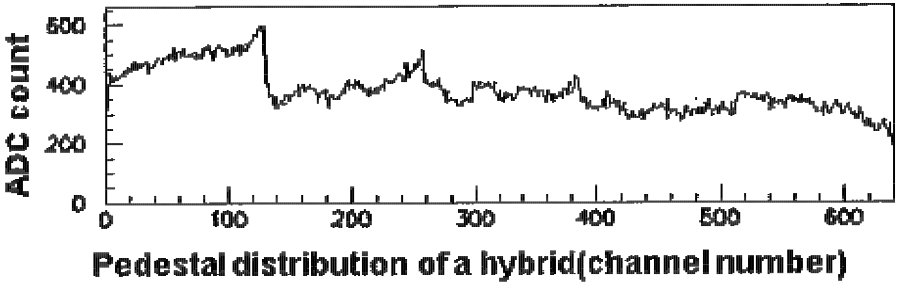
ADC distribution
of clusters
from cosmic data



superimpose

BLADDER data

Offline data
spersification



Cluster finding efficiency

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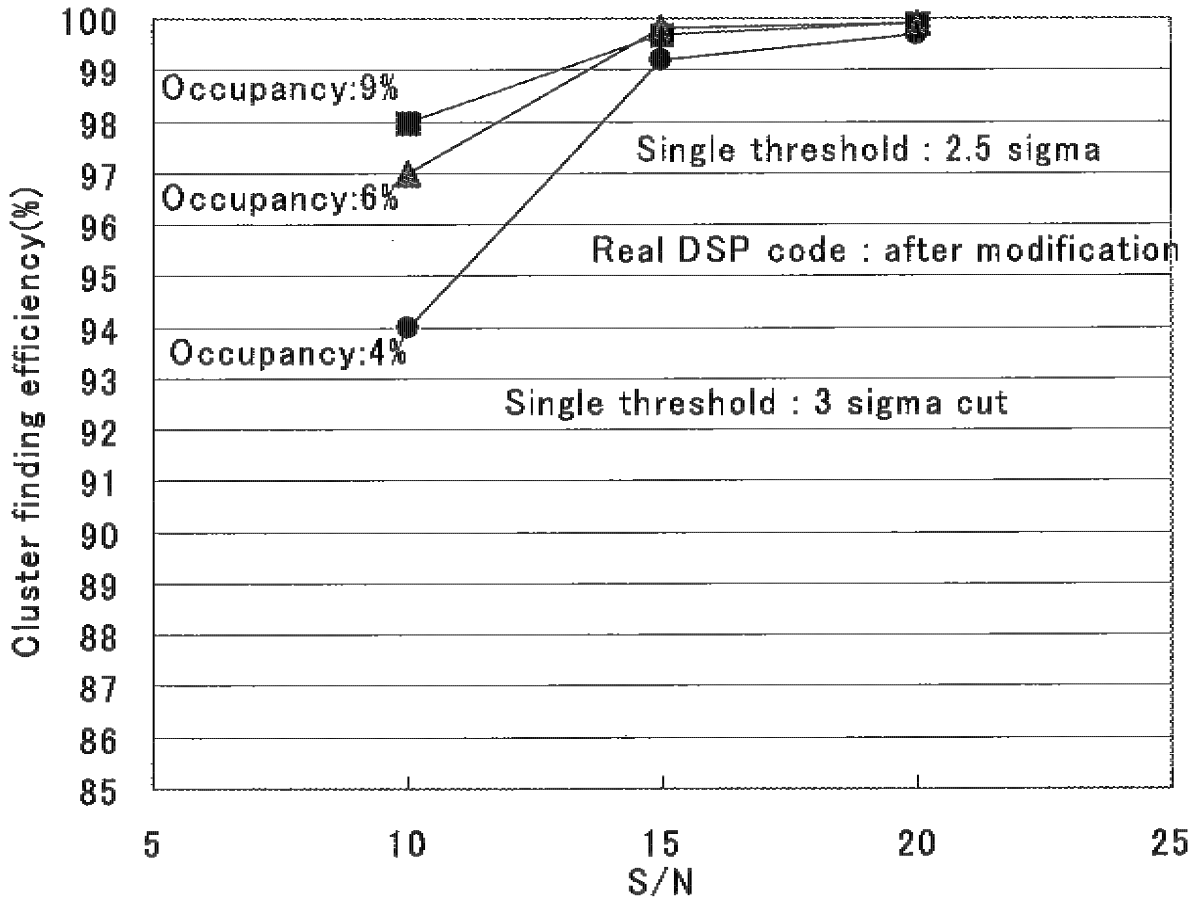
Cluster finding efficiency

SVD

- LER 300mA bladder data was used.
  LER > HER



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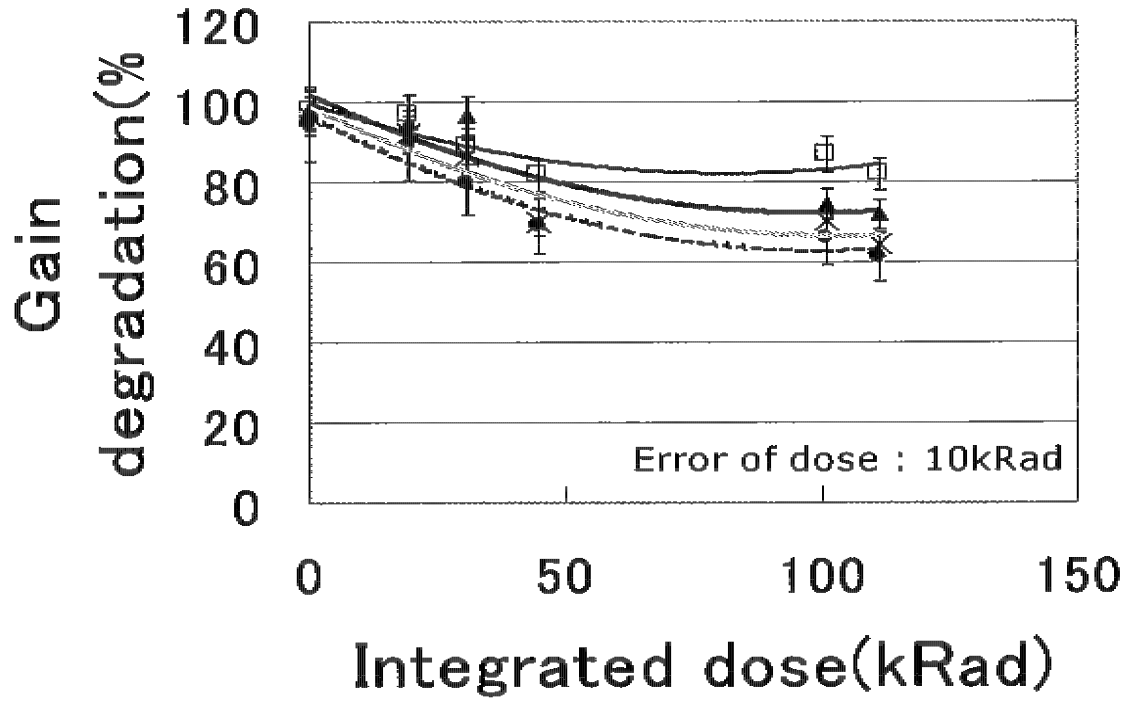
Tuning procedure

- How often we should tune parameters of VA



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What we learned

SVD

- Shaping time should be 1usec, if beam condition is bad.
- If beam condition is good, 2.5 usec because of good S/N.
- Tuning procedure was established.
- Data sparsification algorithm/threshold study based on real bad beam condition

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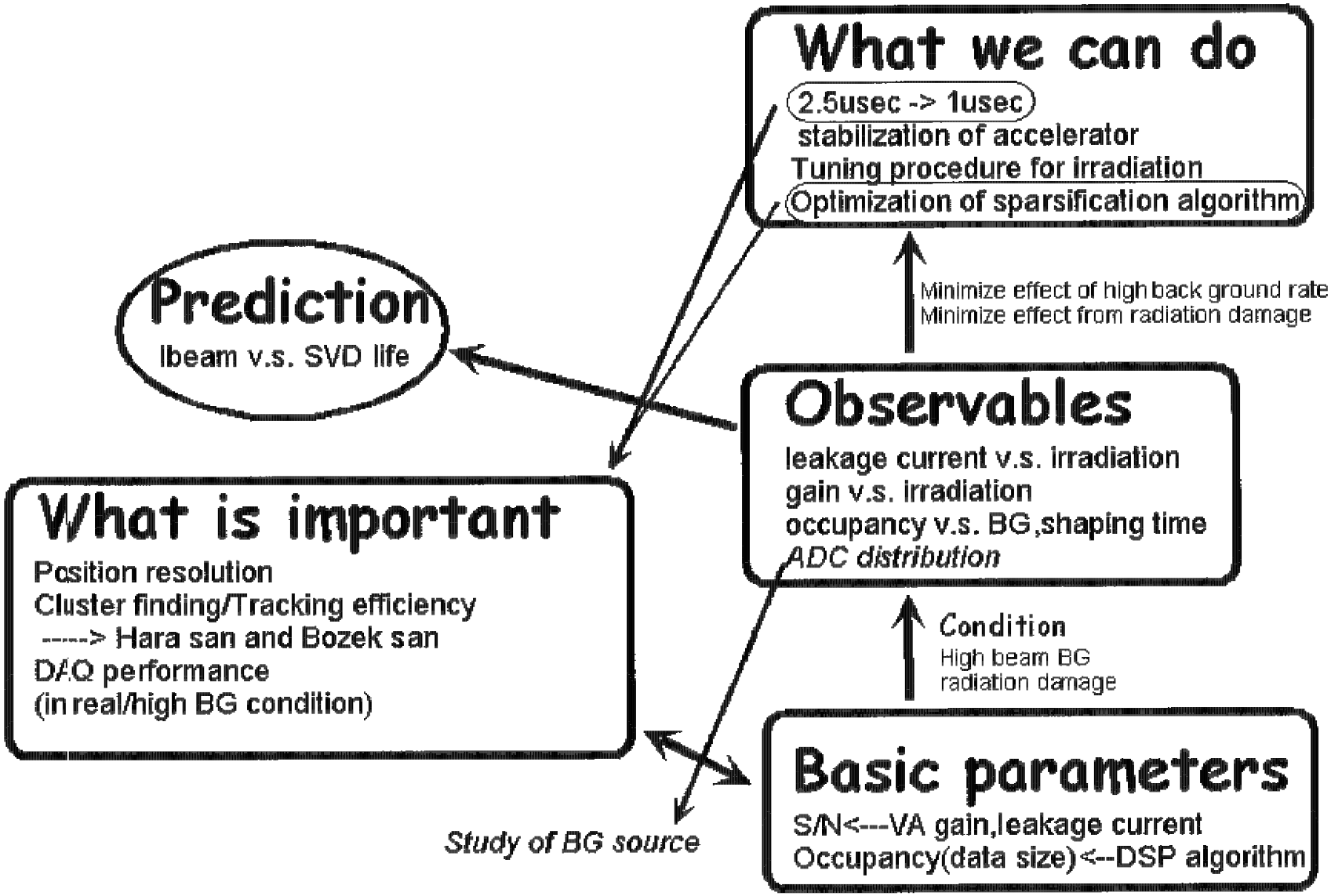

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Conclusion

- Minimize influence from beam BG
  - Shorter shaping time : 1 usec.
  - We have 97% for S/N > 10,
  - But optimization of algorithm/threshold tuning for sparsification/clustering is needed to have margin.
- Minimize performance degradation from rad damage
  - Tuning procedure was established, but still should be improved.

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