

# Analysis of problematic ASIC's in the May beamtest at CERN

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# Problematic ASIC's in the barrel modules

- Two modules with problematic ASIC's were beamtested before irradiation, with a module showing large s-curve wiggles
- 20220040200018(link1) - large s-curve wiggles
- 20220170200447(S03) - Large Gain Spread
- 20220170200010(S03) - Negative offset

# Large Oscillation

**20220040200018**

**S10 (1025-1152)**

**mask file**

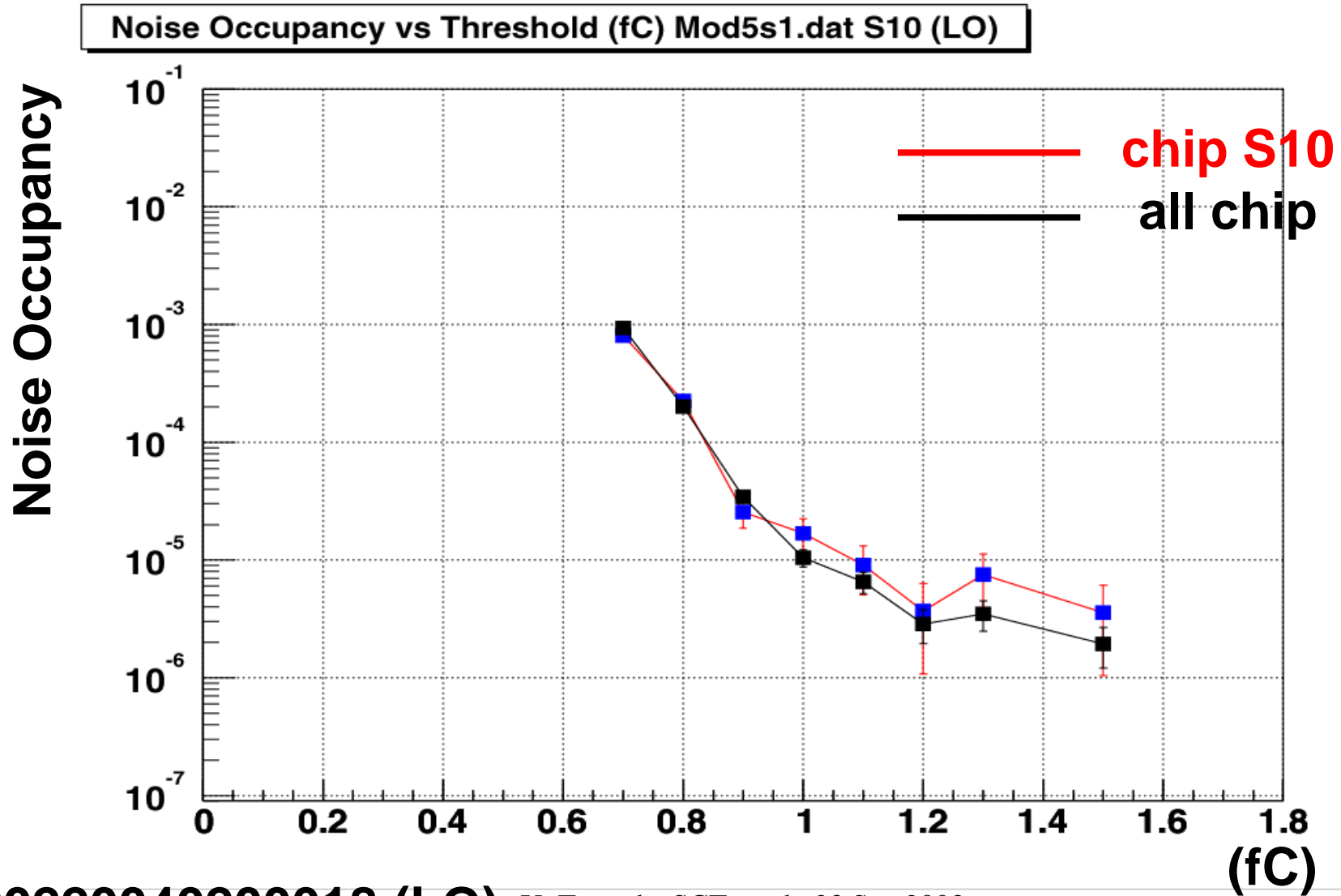
**hotchan**

**dead 1238,1248,1250,1252**

**noisy 928**

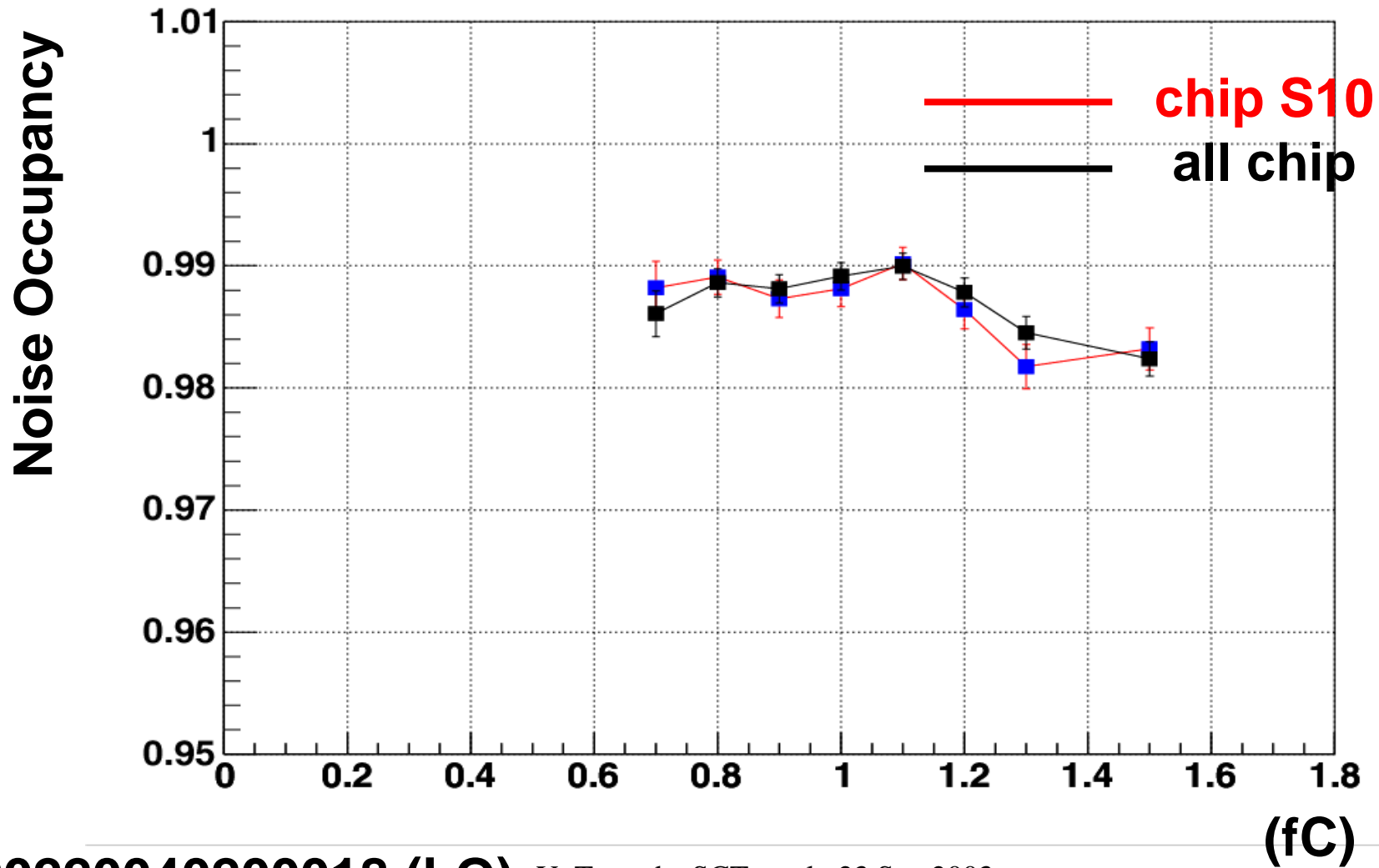
**sick**

# Noise Occupancy

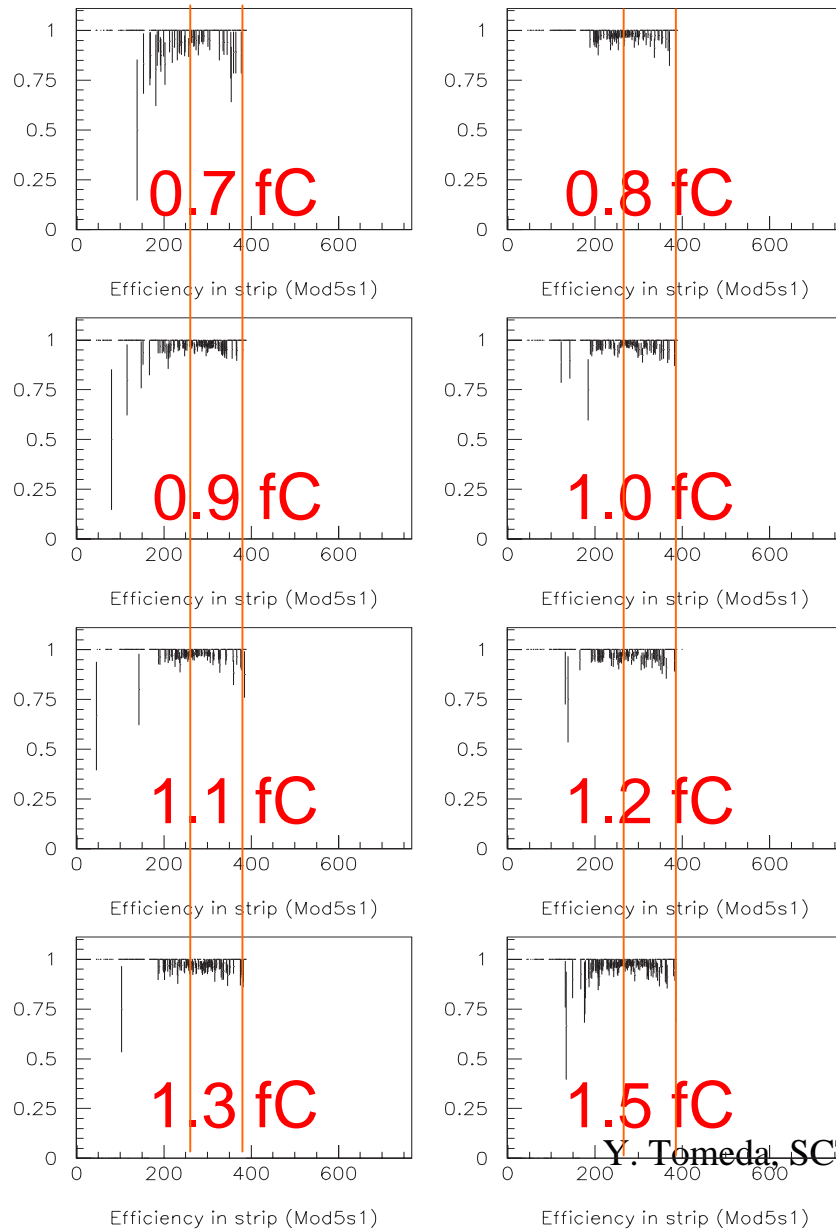


# Efficiency

Efficiency vs Threshold (fC) Mod5s1.dat S10 (LO)



# S10 (1025-1152)



Y. Tomeda, SCT week, 23 Sep 2003

# Large Gain Spread

**20220170200447**

**S03 (385-512)**

**mask file**

**hotchan**

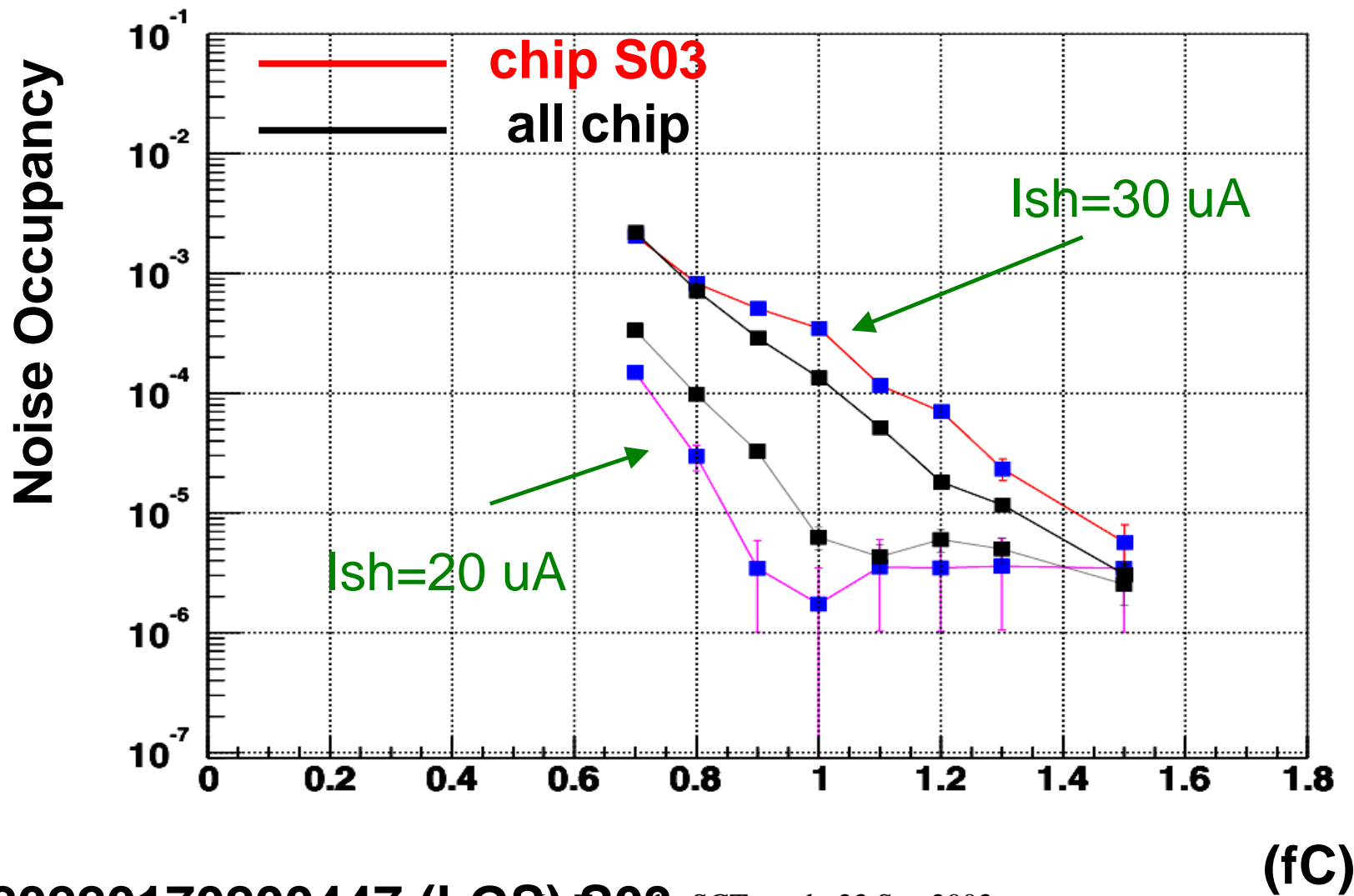
**dead**

**noisy            310,311**

**sick**

# Noise Occupancy

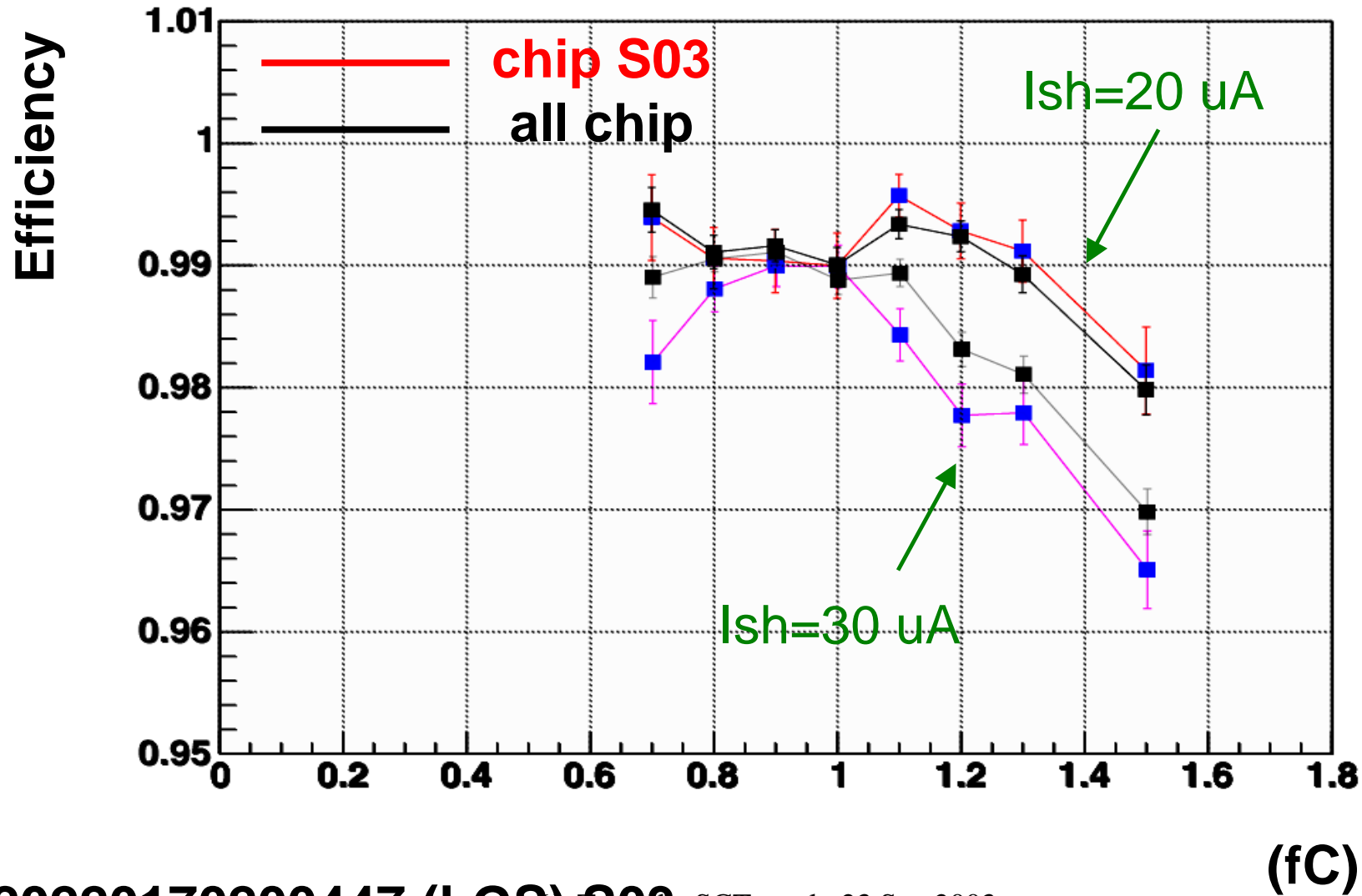
Noise Occupancy vs Threshold (fC) Mod7s0.dat S03 (LGS)





# Efficiency

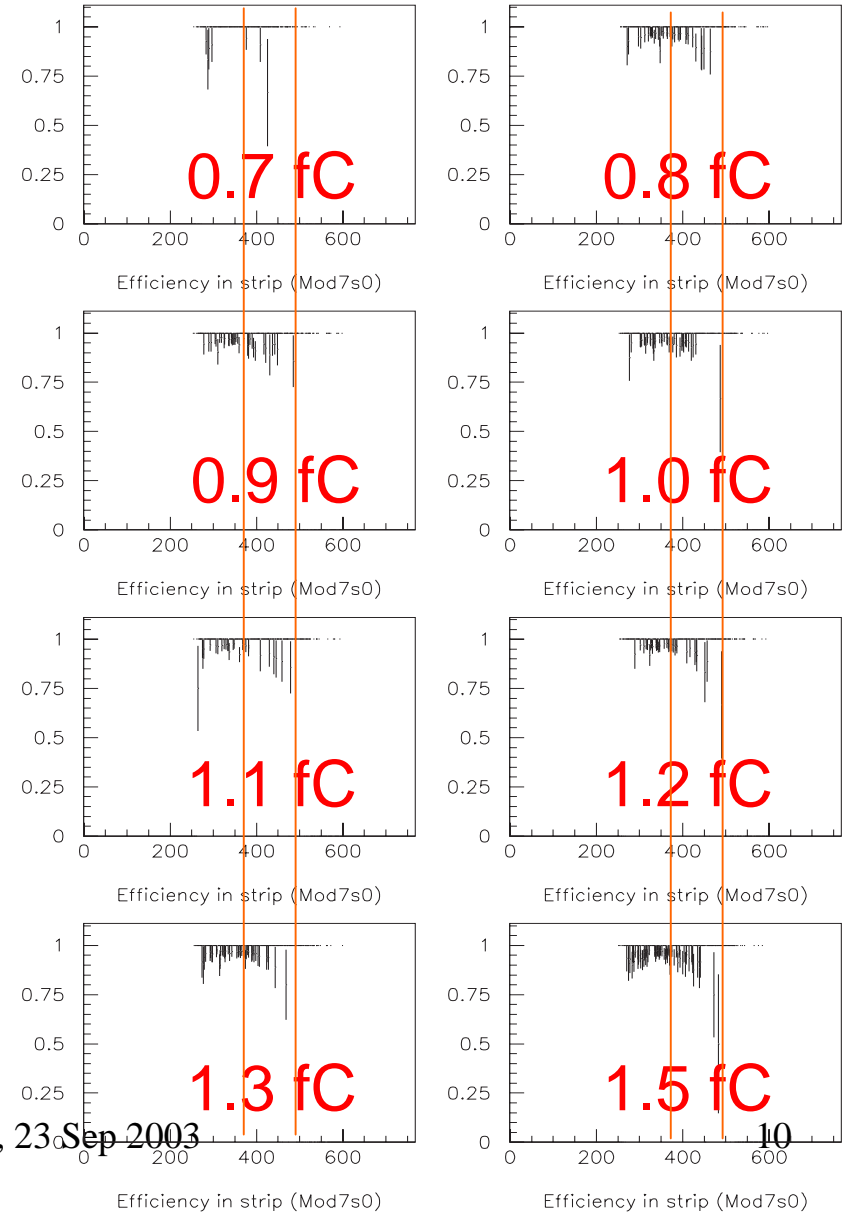
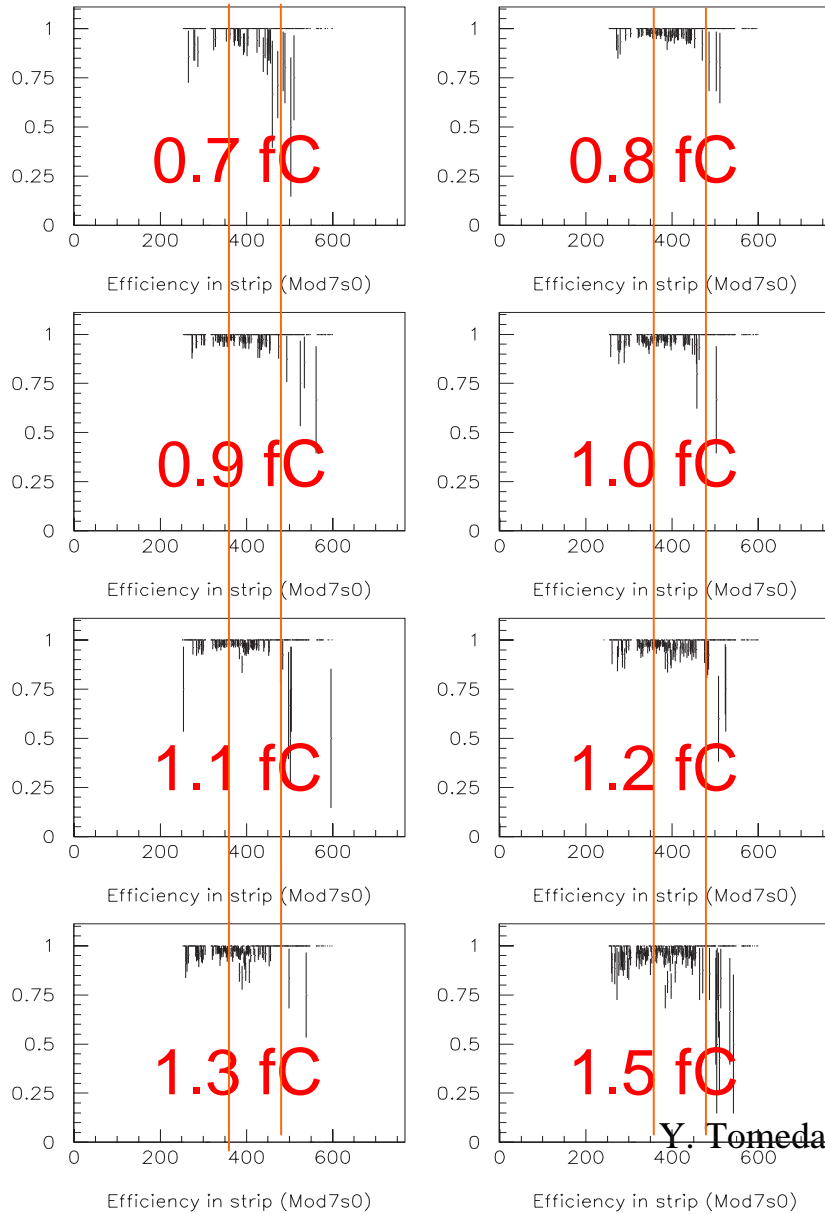
Efficiency vs Threshold (fC) Mod7s0.dat S03 (LGS)



# S03 (385-512)

Ish=30 uA

Ish=20 uA



# Negative Offset

**20220170200010**

**S03 (385-512)**

**mask file**

**hotchan**

**dead 2,3**

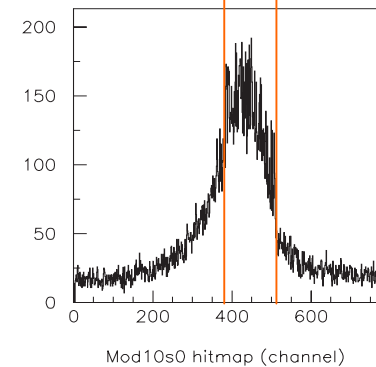
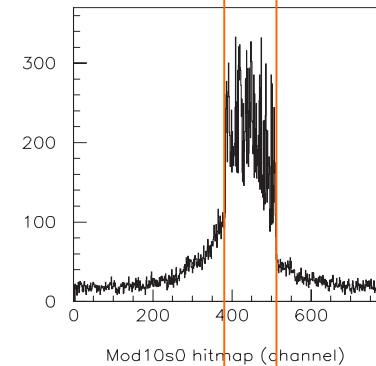
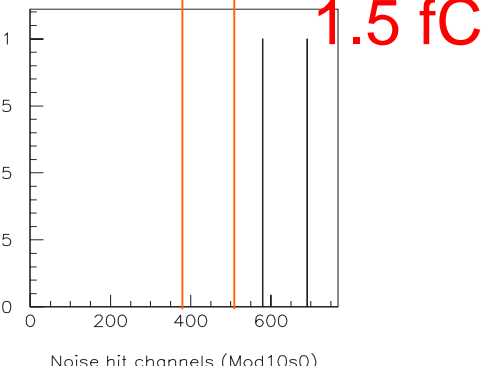
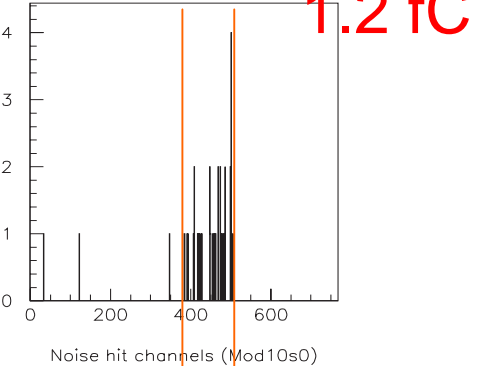
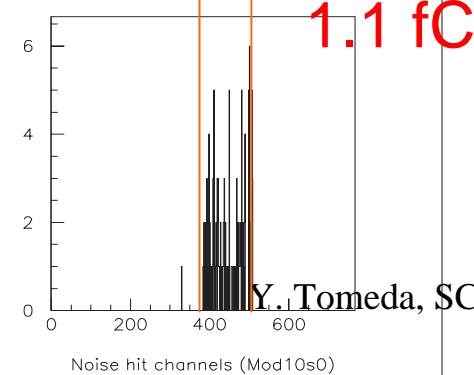
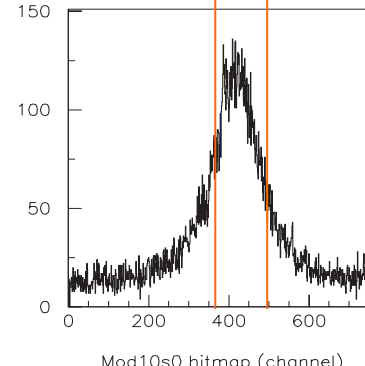
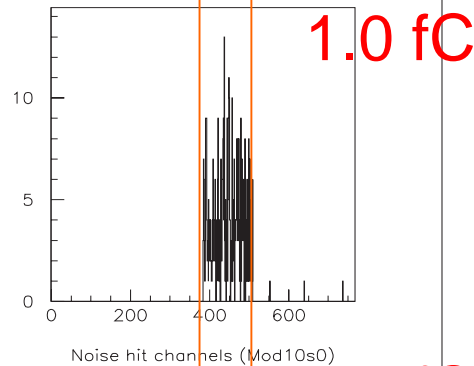
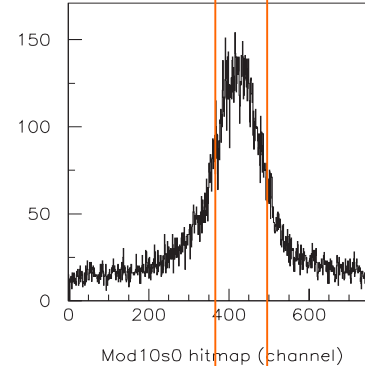
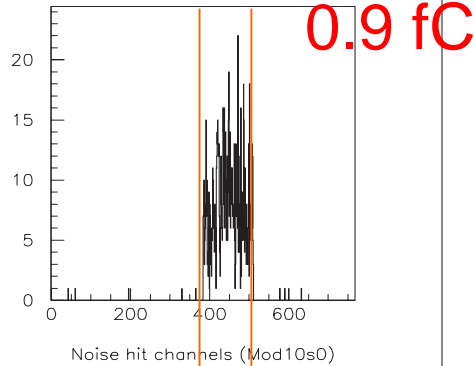
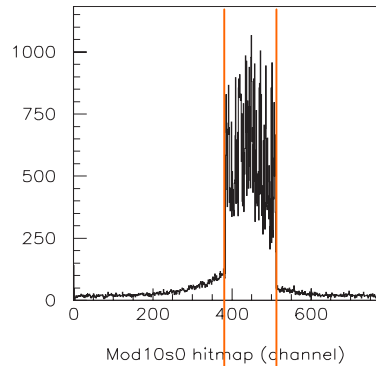
**noisy**

**sick**

# Negative Offset

hit map

noise hit map



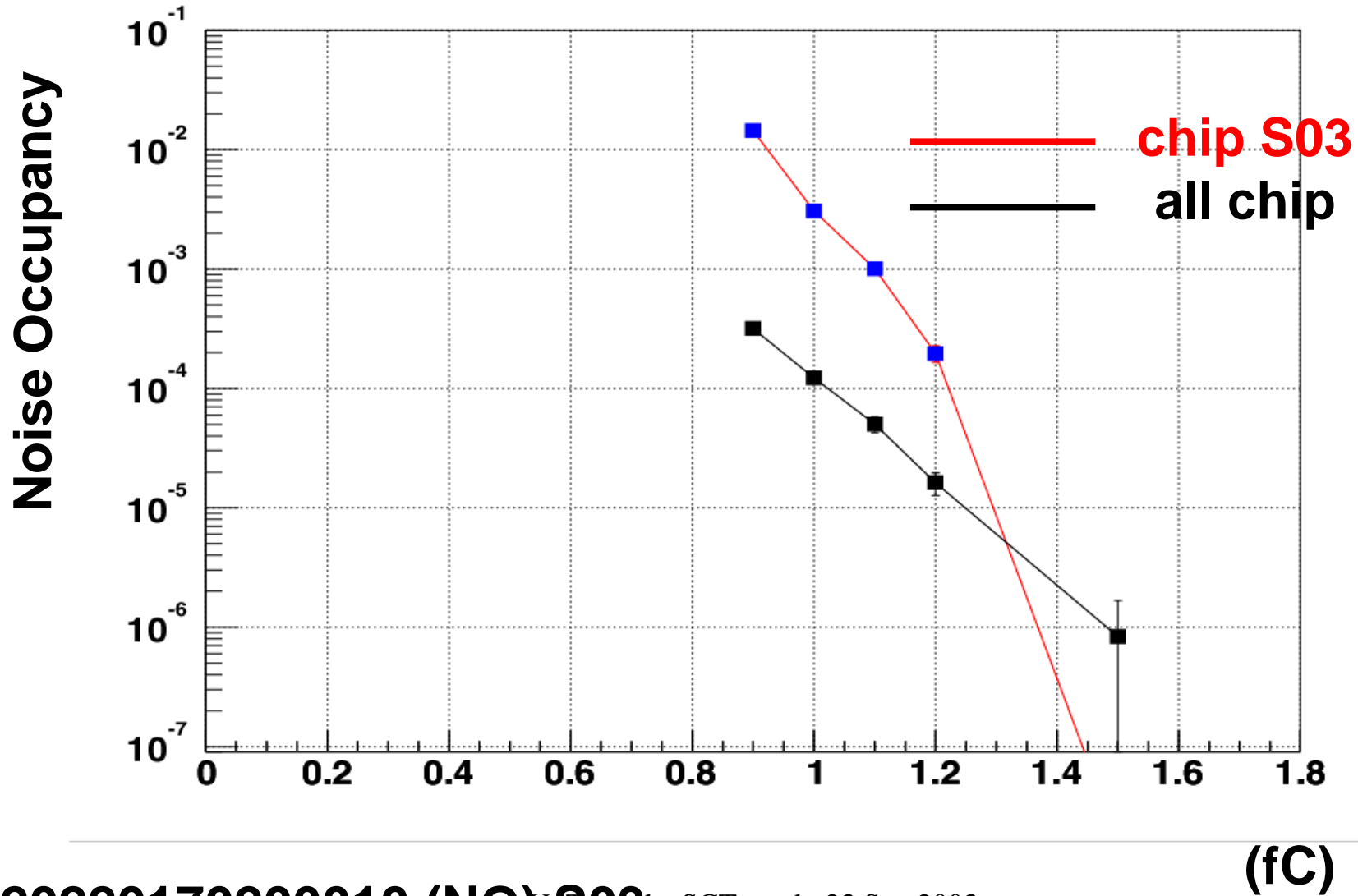
**S03 (385-512)**

**20220170200010 (NO) S03**

Y. Tomeda, SCT week, 23 Sep 2003

# Noise Occupancy

Noise Occupancy vs Threshold (fC) Mod10s0.dat S03 (NO)

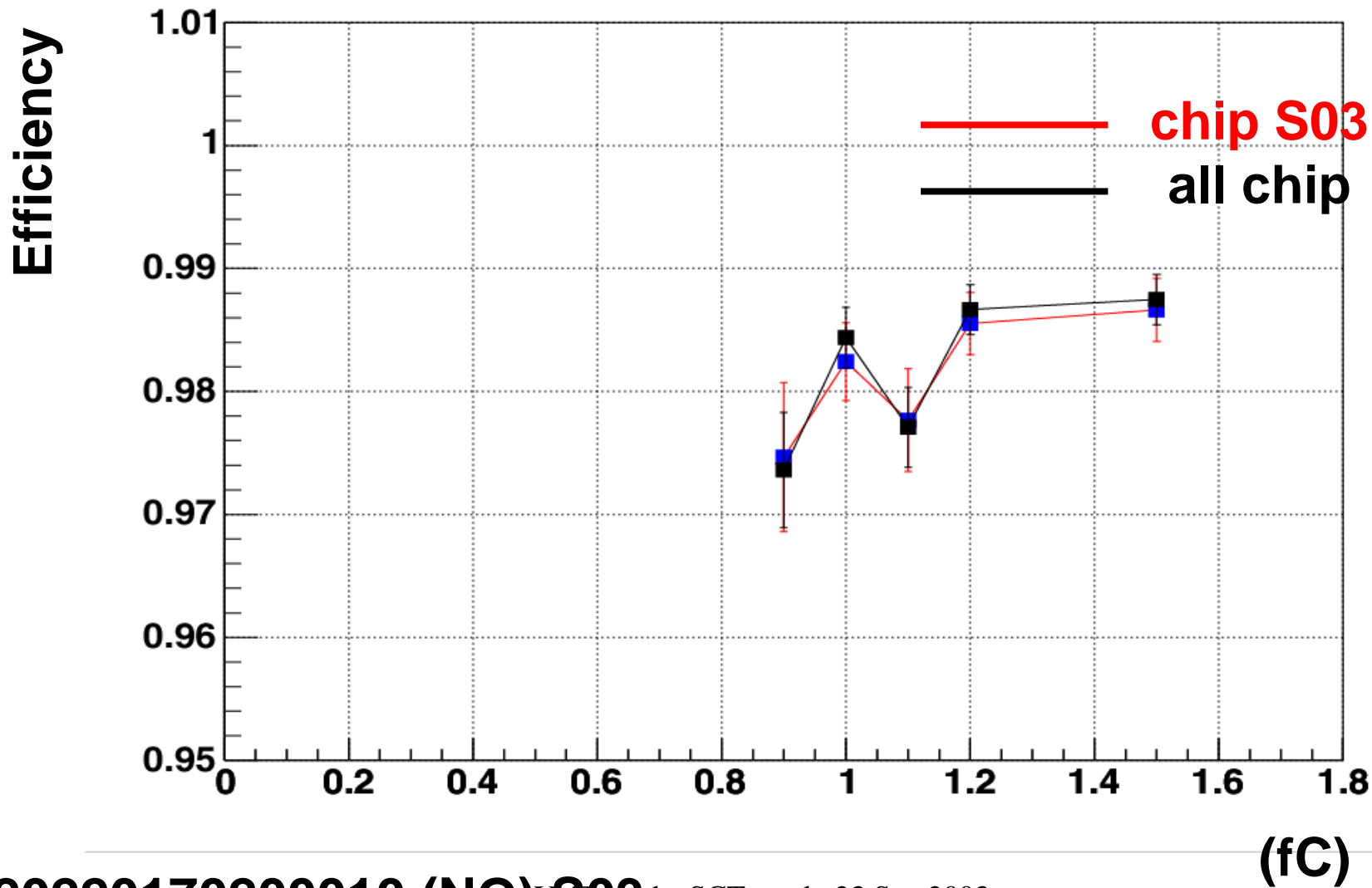


20220170200010 (NO) S03

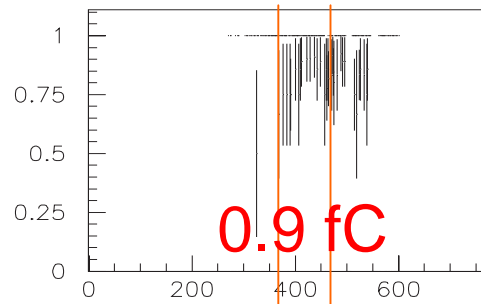
Y. S. Kim, SCT week, 23 Sep 2003

# Efficiency

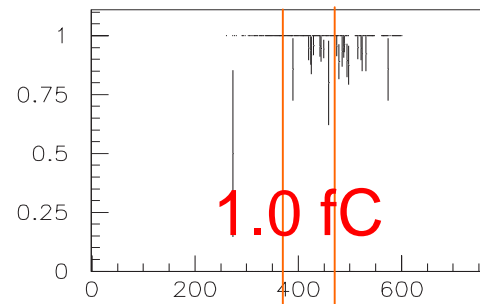
Efficiency vs Threshold (fC) Mod10s0.dat S10 (NO)



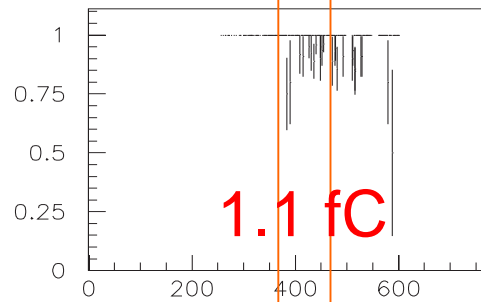
# S03 (385-512)



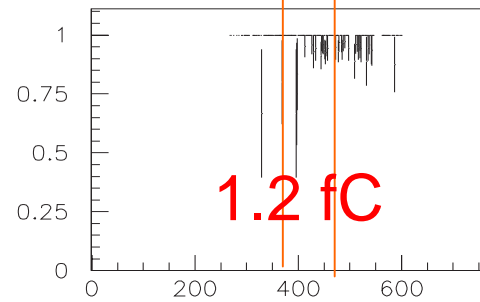
Efficiency in strip (Mod7s0)



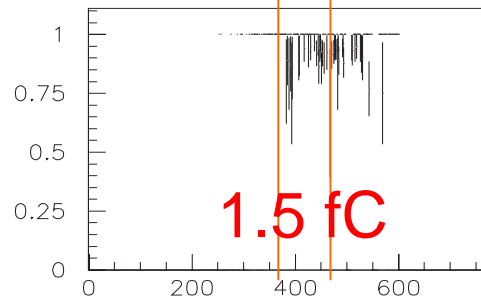
Efficiency in strip (Mod7s0)



Efficiency in strip (Mod7s0)



Efficiency in strip (Mod7s0)



Efficiency in strip (Mod7s0)

# Conclusions

- Large s-curve wiggles - OK ( $\geq 0.7$  fC)
- LGS - OK with  $I_{sh}=20$   $\mu$ A
- Negative offset - high occupancy ( $>5 \times 10^{-4}$ )  $< 1.2$  fC and slightly lower efficiency (by  $\sim 1\%$ ?)