

# 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**

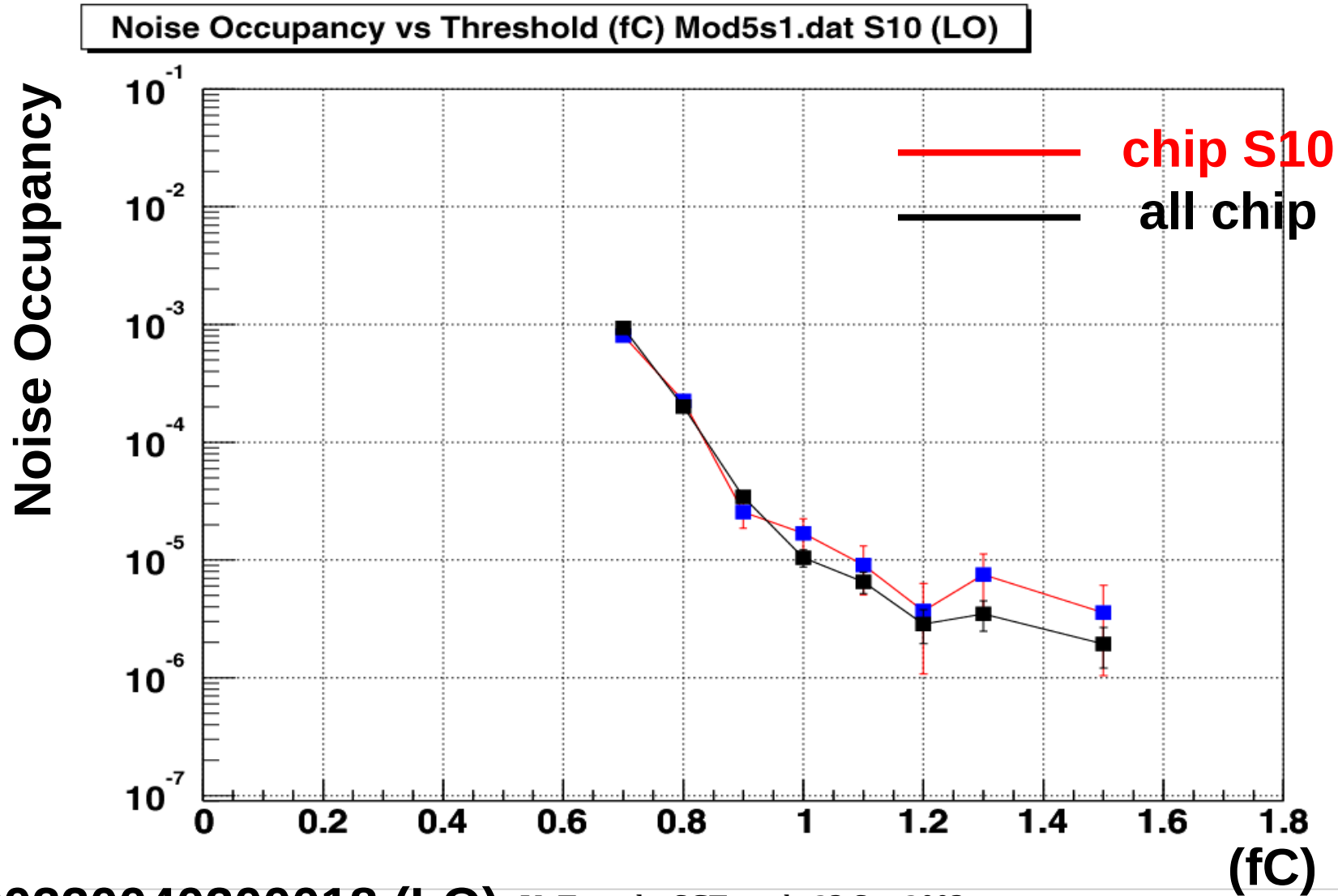
**hotchan**

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

**noisy 928**

**sick**

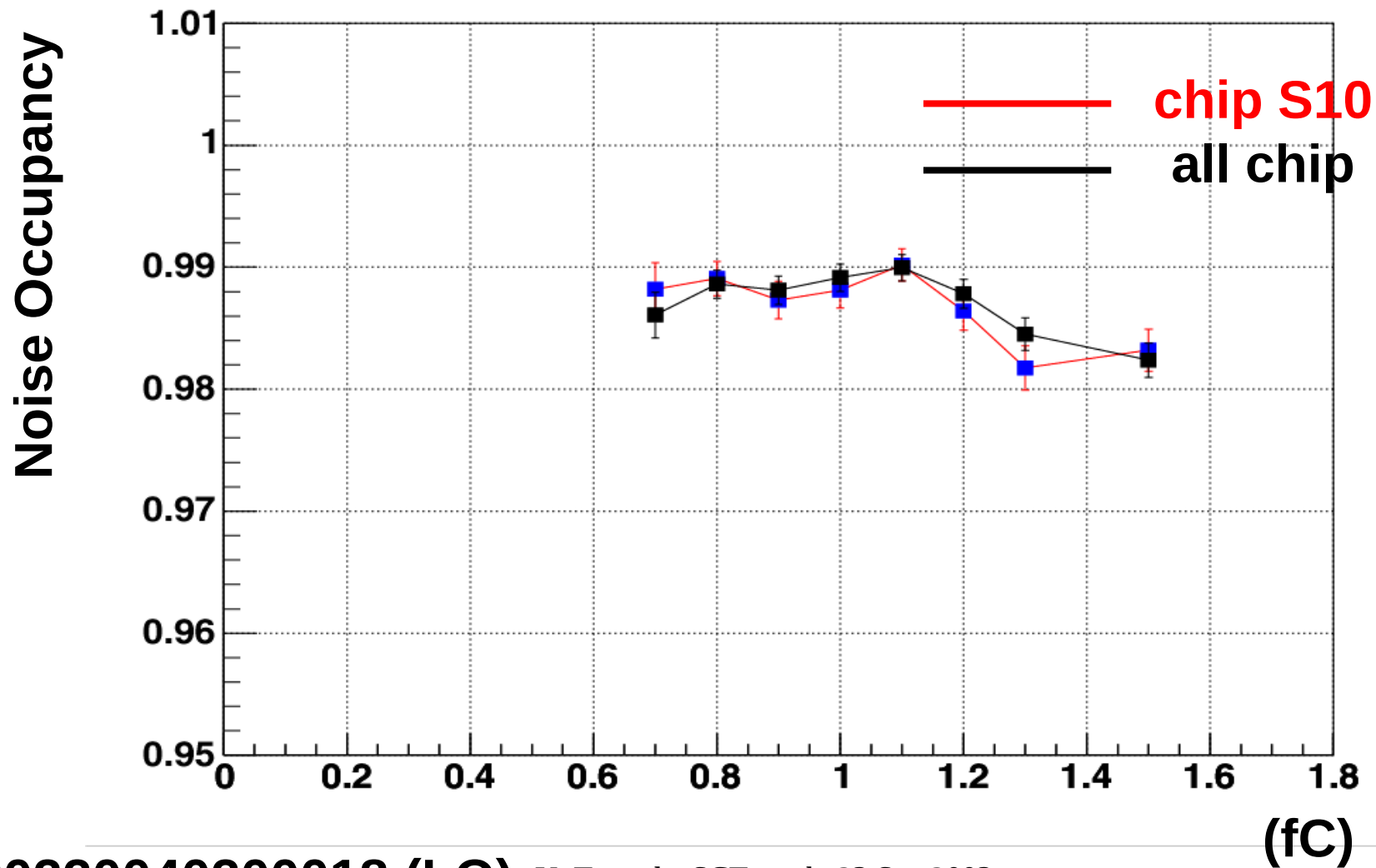
# Noise Occupancy



20220040200018 (LO) Y. Tomeda, SCT week, 23 Sep 2003

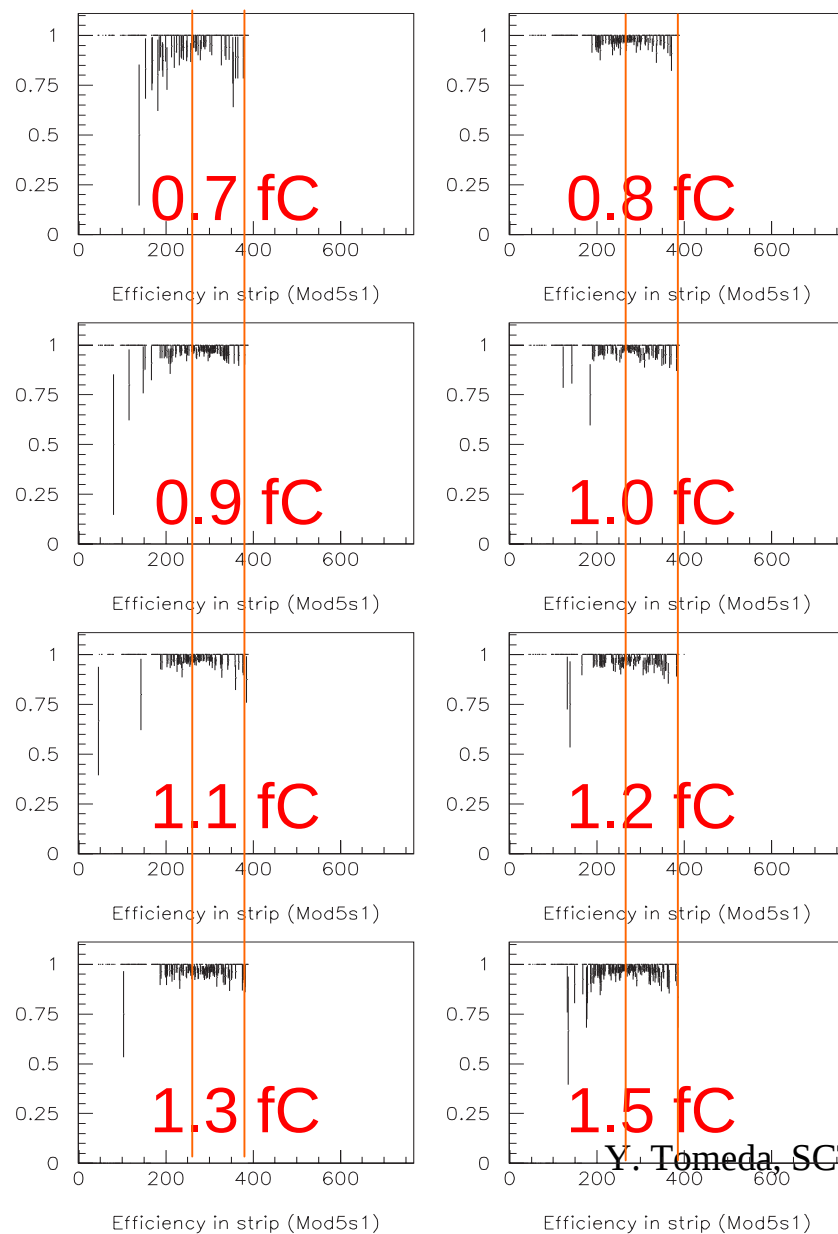
# Efficiency

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



20220040200018 (LO) Y. Tomeda, SCT week, 23 Sep 2003

# S10 (1025-1152)



Y. Tomeda, SCT week, 23 Sep 2003

# Large Gain Spread

**20220170200447**

**S03 (385-512)**

**mask file**

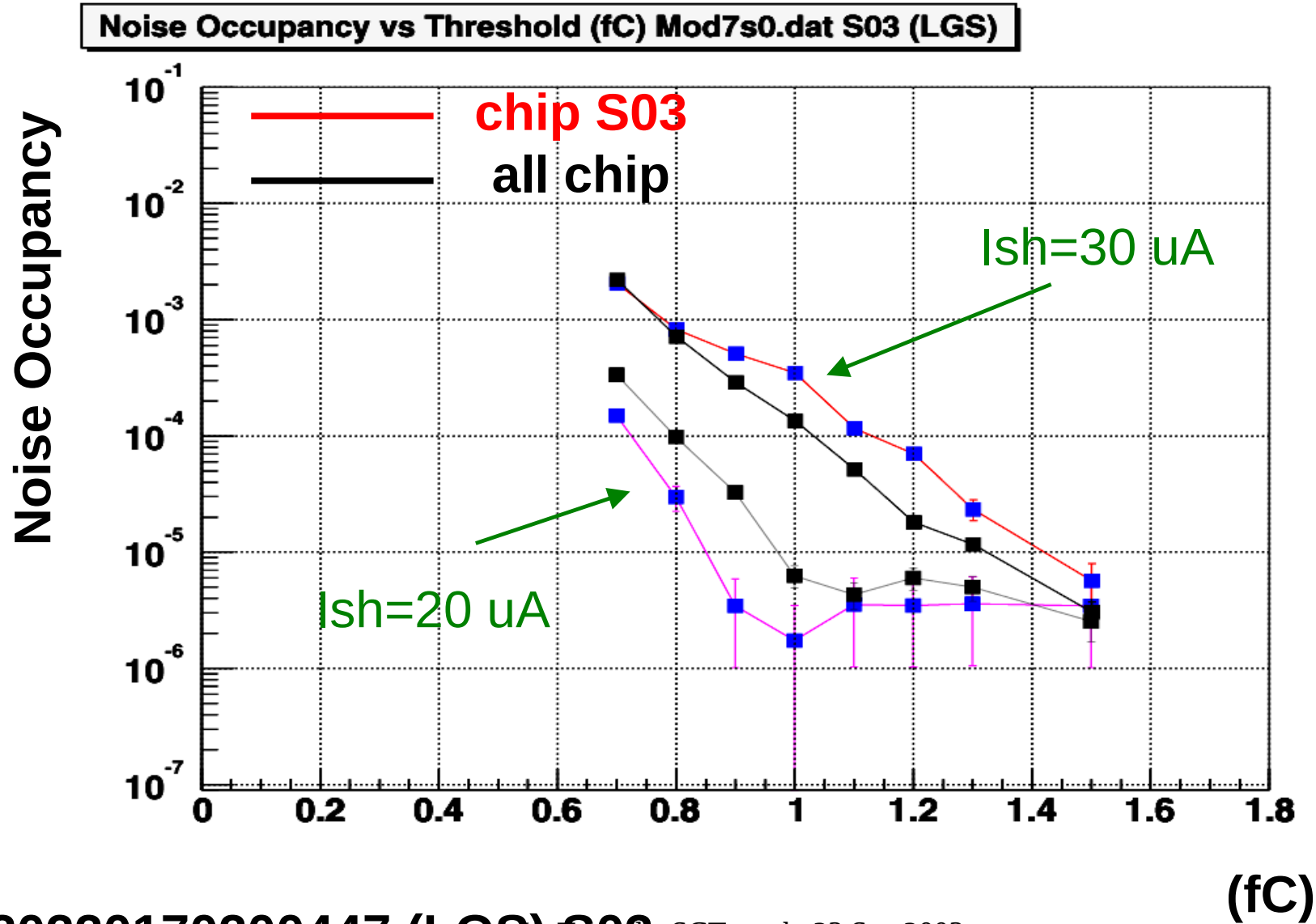
**hotchan**

**dead**

**noisy            310,311**

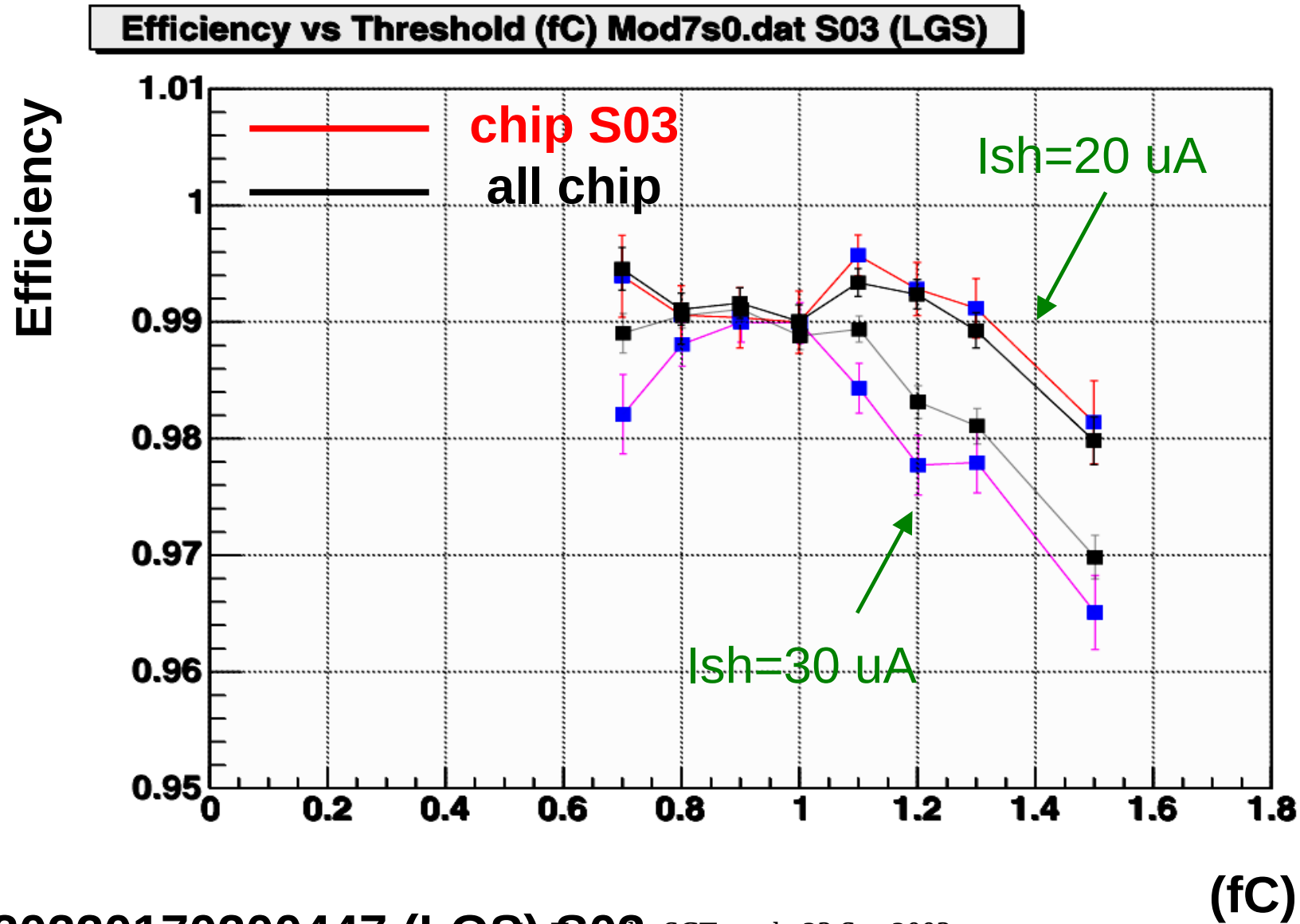
**sick**

# Noise Occupancy



20220170200447 (LGS) S03, SCT week, 23 Sep 2003

# Efficiency

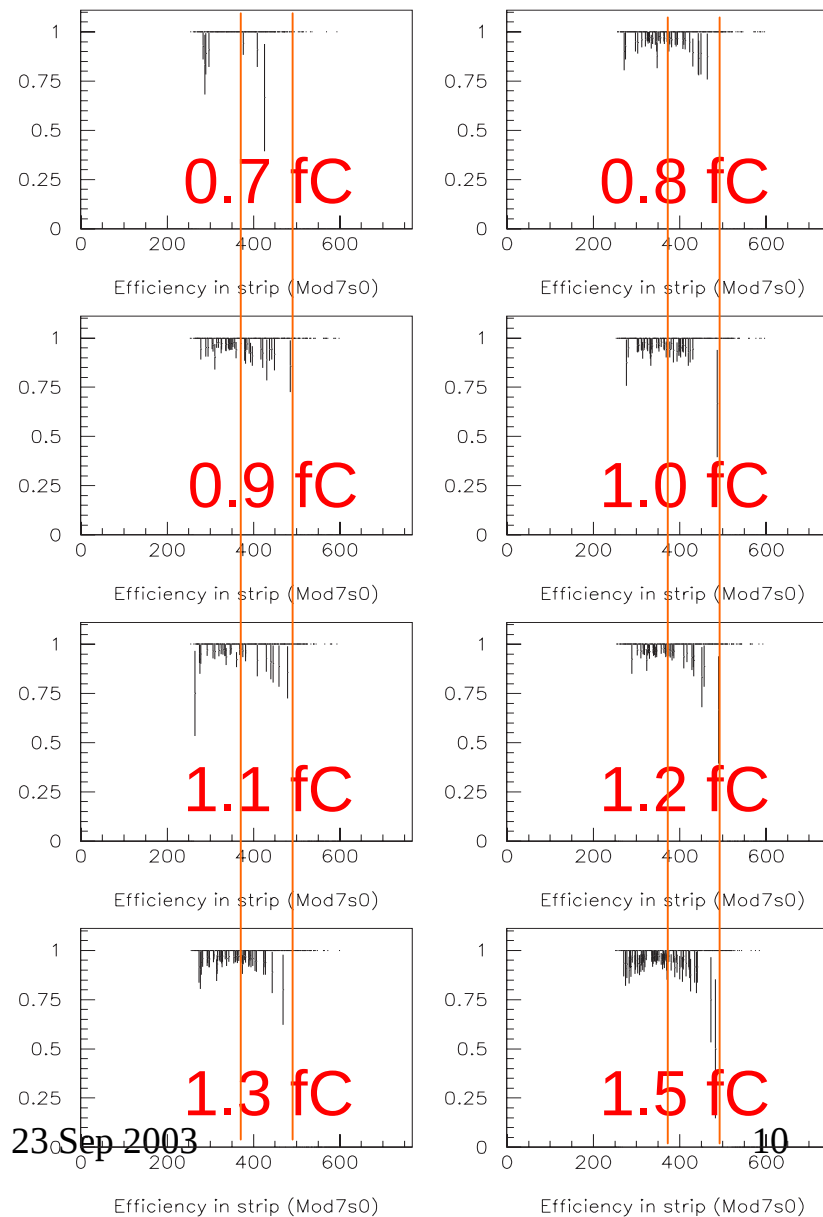
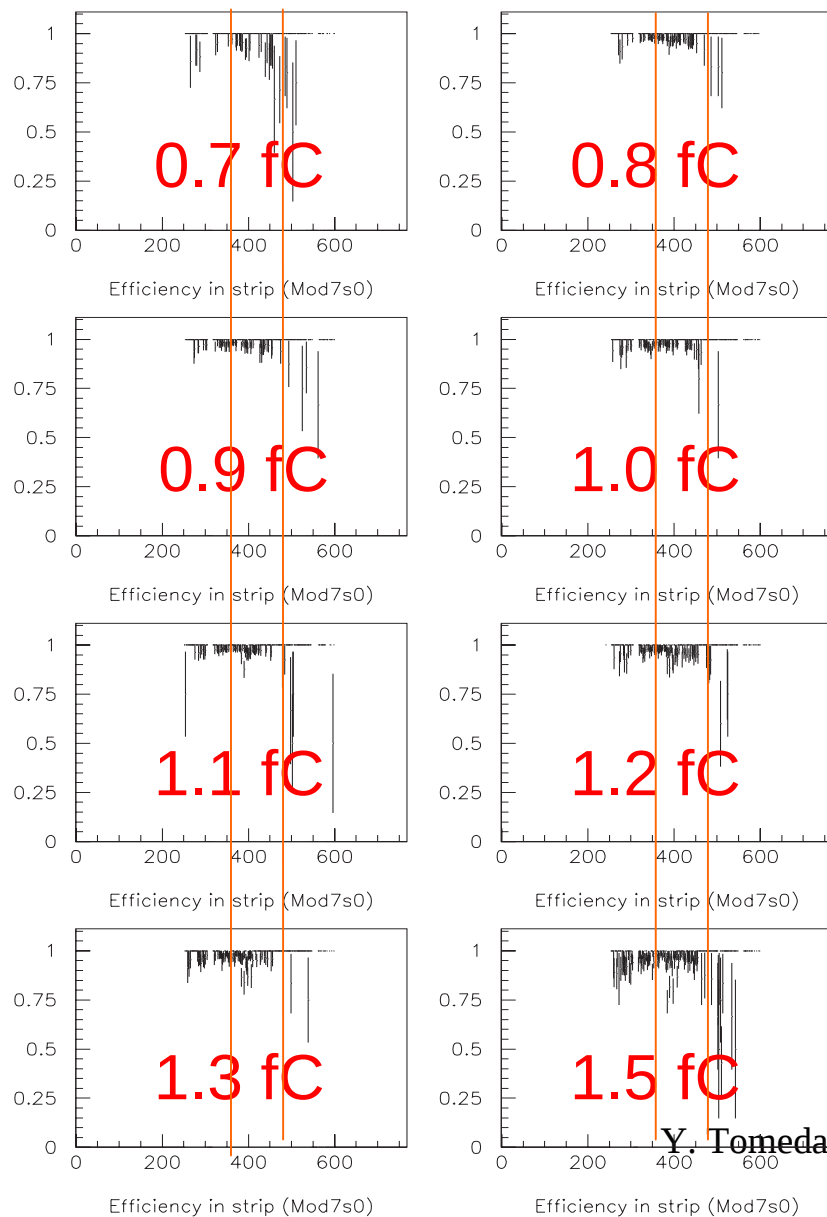


20220170200447 (LGS) S03, SCT week, 23 Sep 2003

Ish=30 uA

S03 (385-512)

Ish=20 uA



# Negative Offset

**20220170200010**

**S03 (385-512)**

**mask file**

**hotchan**

**dead 2,3**

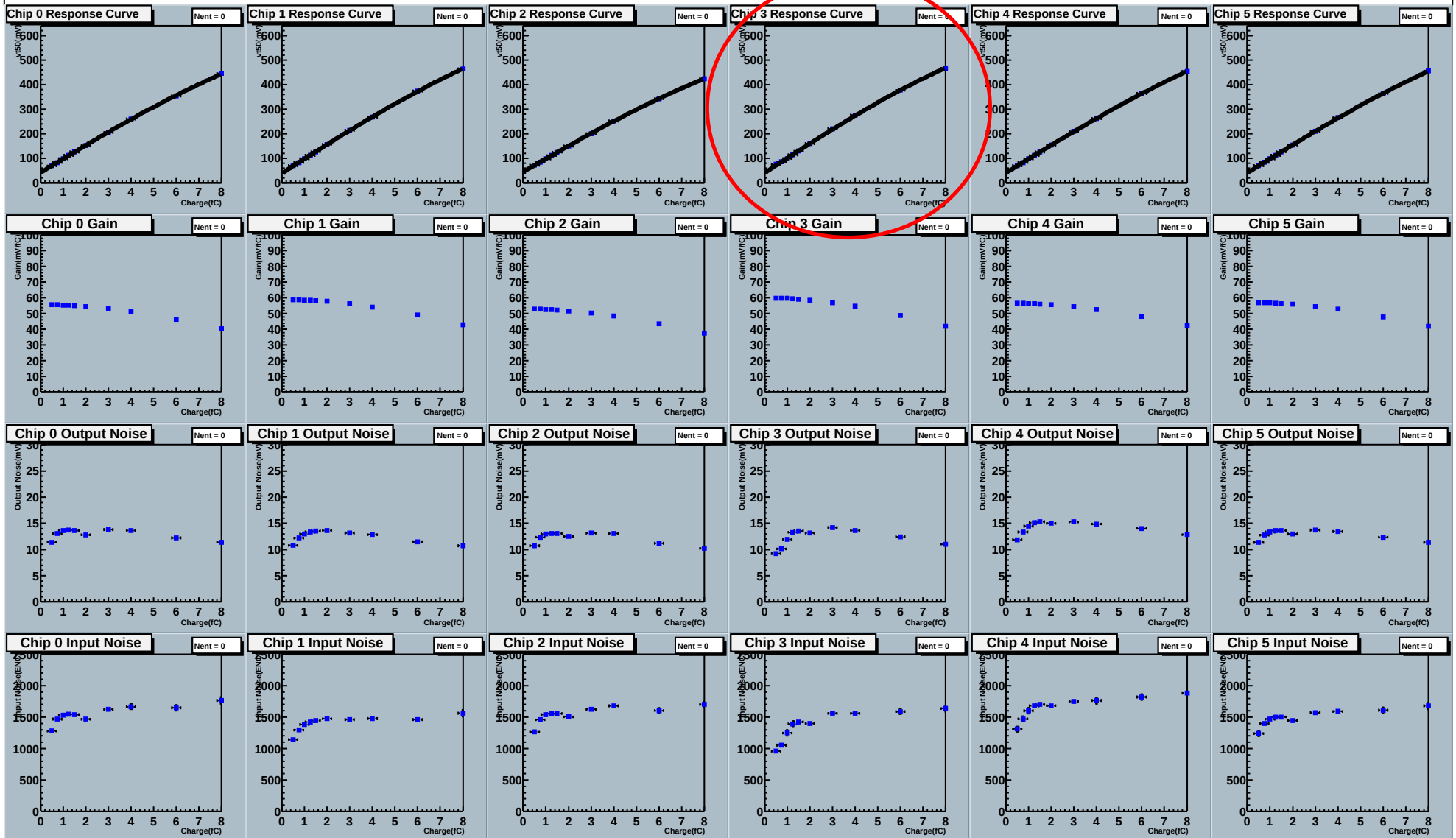
**noisy**

**sick**

# Negative Offset - RC plot

ATLAS SCT Module Test: Response Curve - Thu Jun 06 20:14:29 2002 - KEK - Module 20220170200010mDaqLT

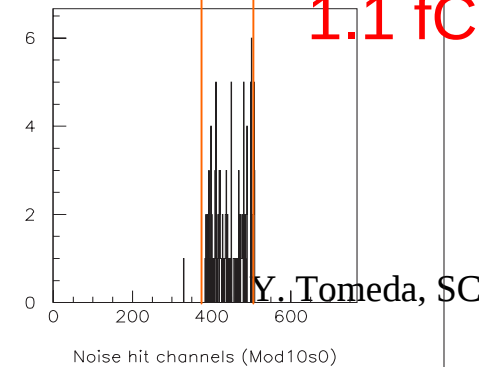
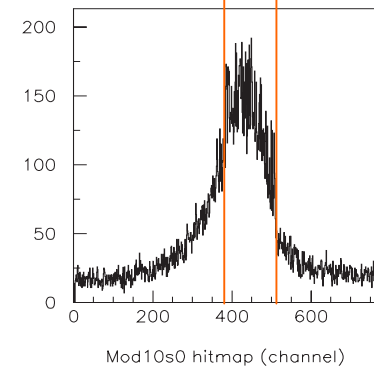
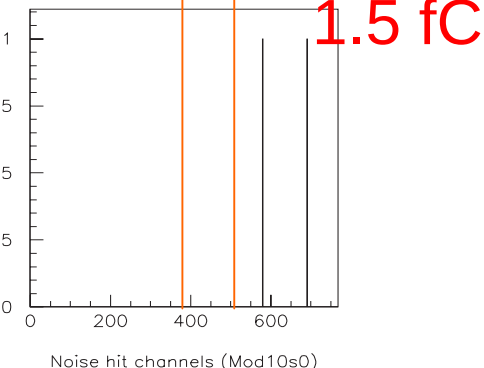
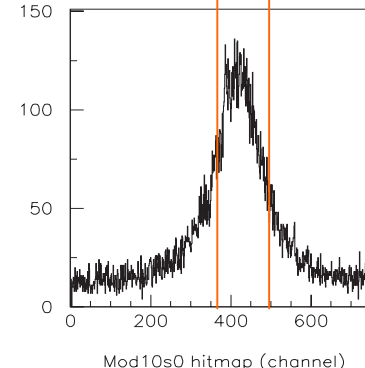
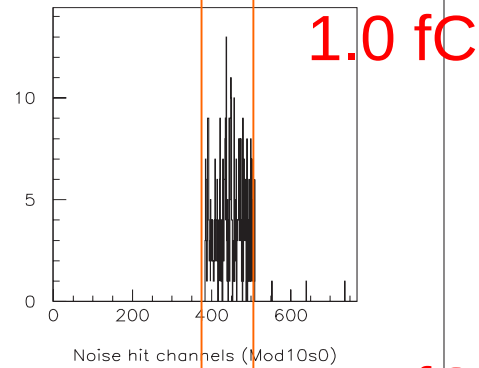
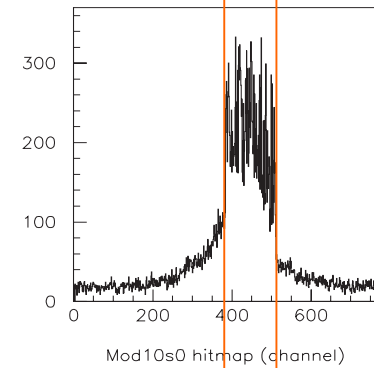
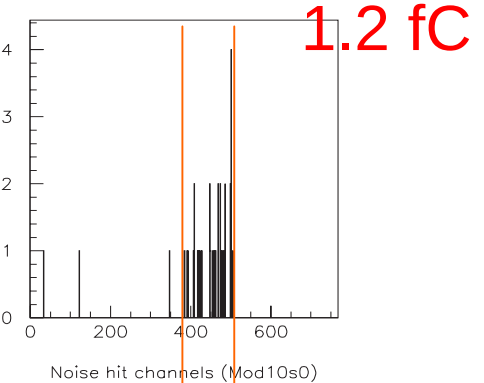
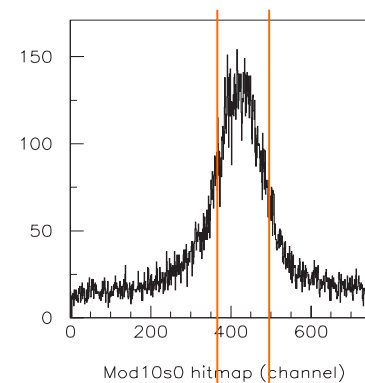
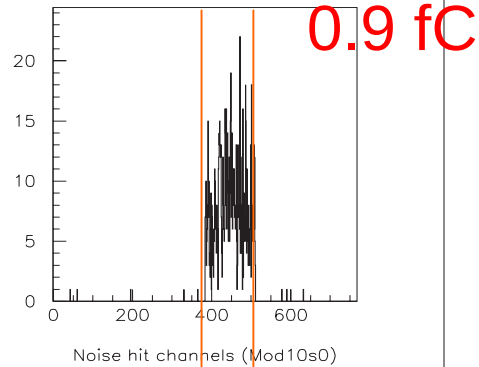
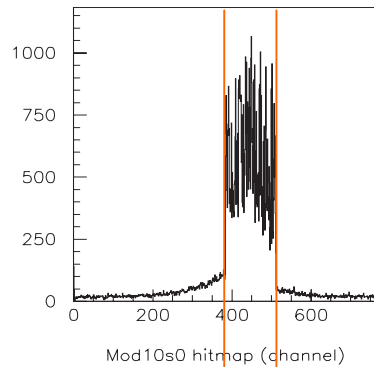
Page 2 Run 6221 Start Scan 44 Module 0 Stream 0



# Negative Offset

hit map

noise hit map

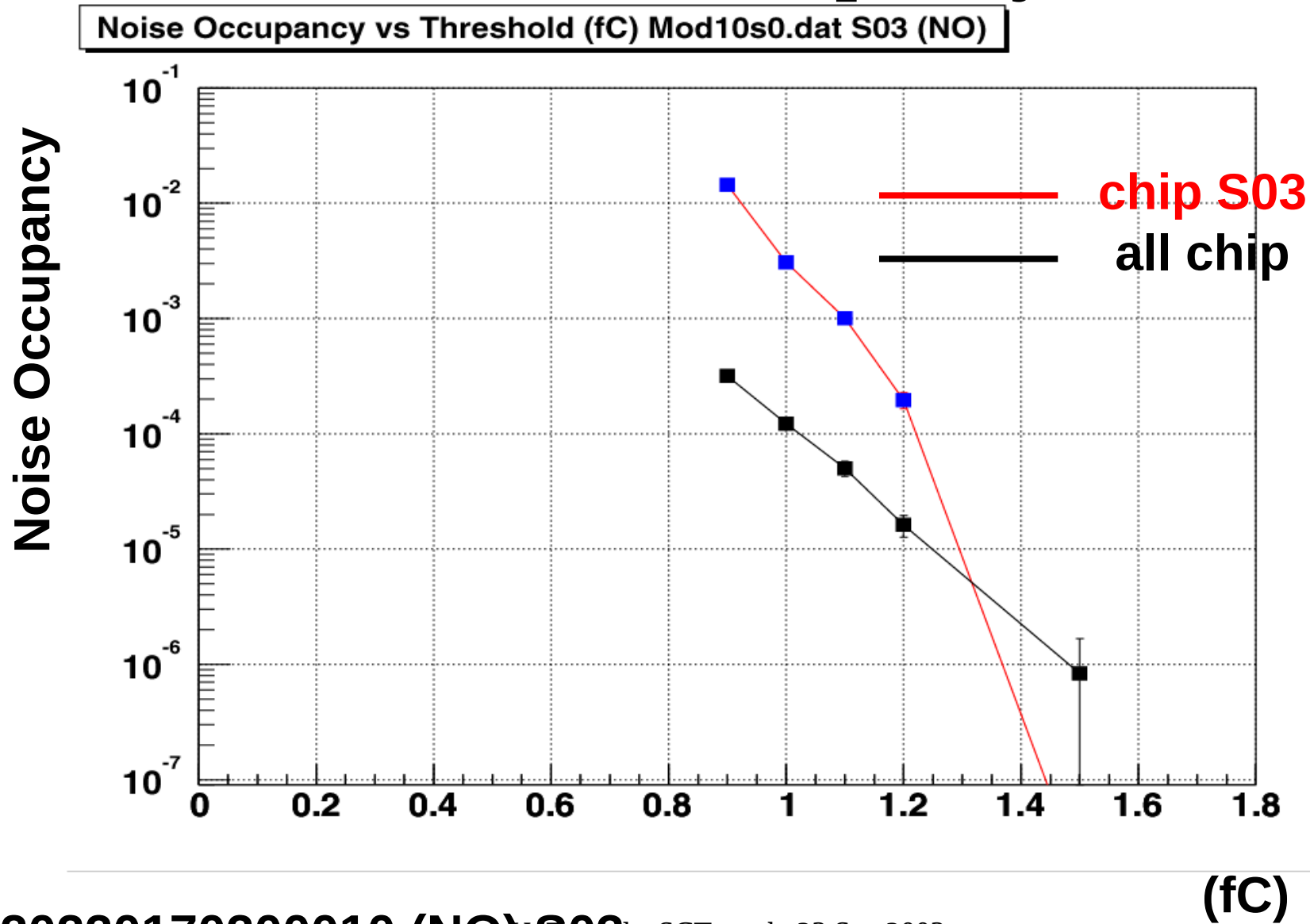


**S03 (385-512)**

**20220170200010 (NO) S03**

Y. Tomeda, SCT week, 23 Sep 2003

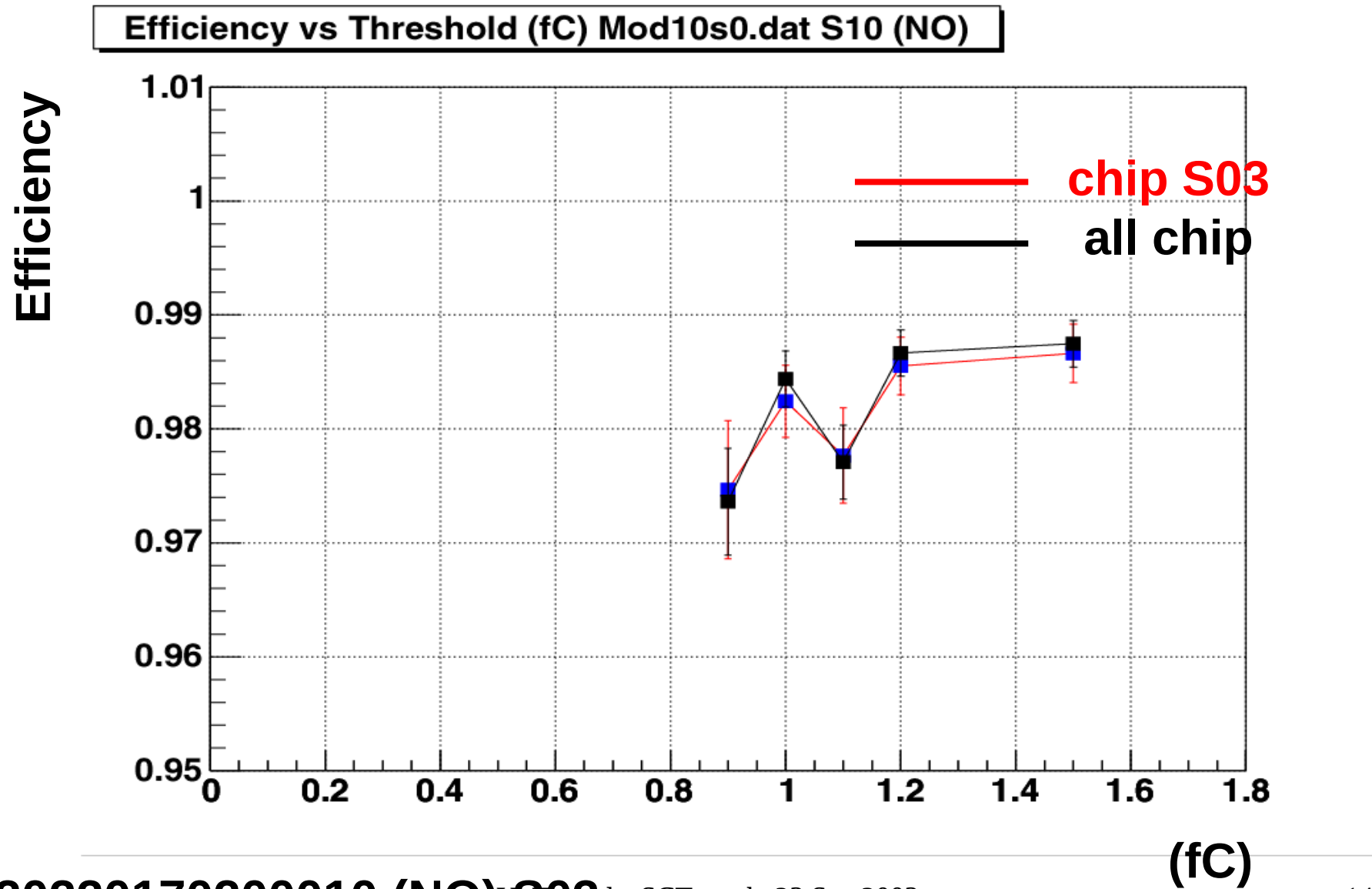
# Noise Occupancy



20220170200010 (NO) S03

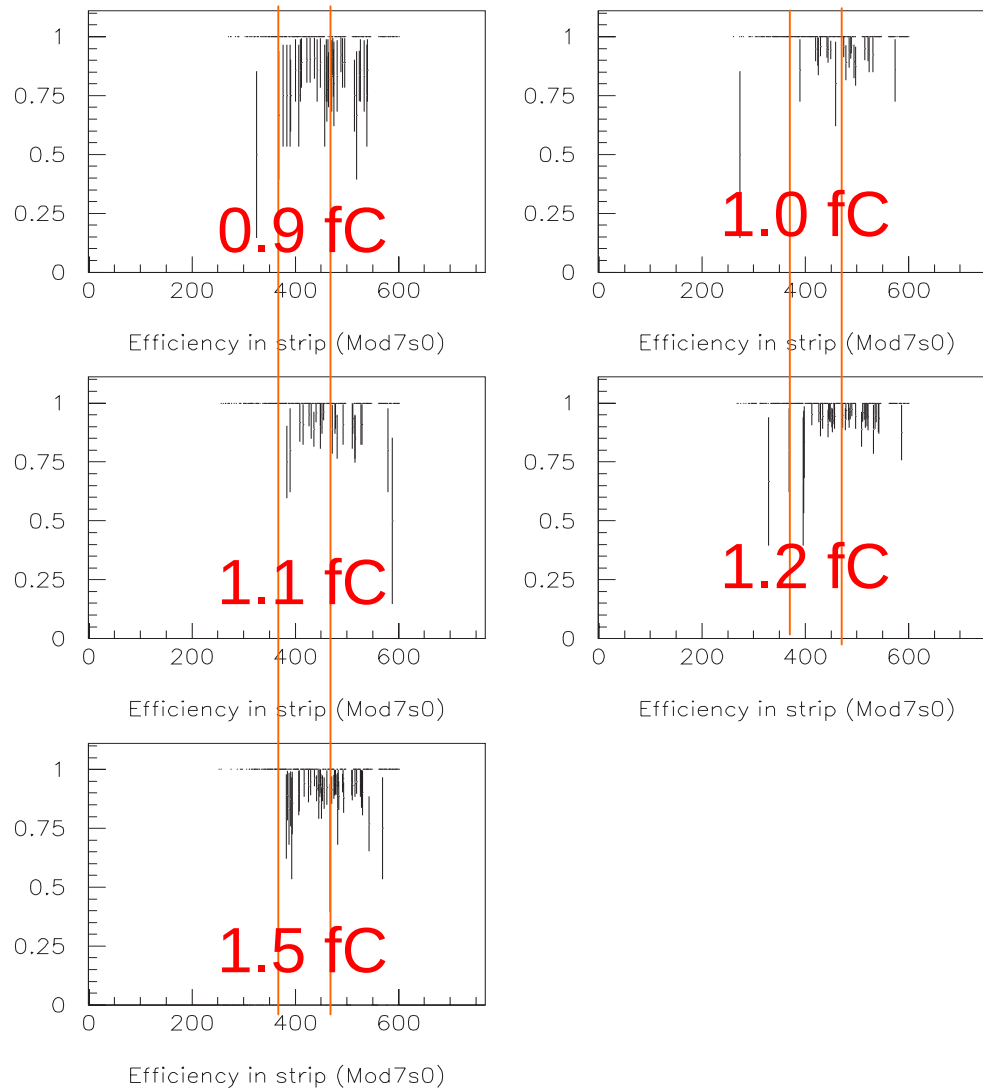
Y. S. Kim, SCT week, 23 Sep 2003

# Efficiency



20220170200010 (NO) S03 Y. Tomoda, SCT week, 23 Sep 2003

## S03 (385-512)



# Conclusions

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