

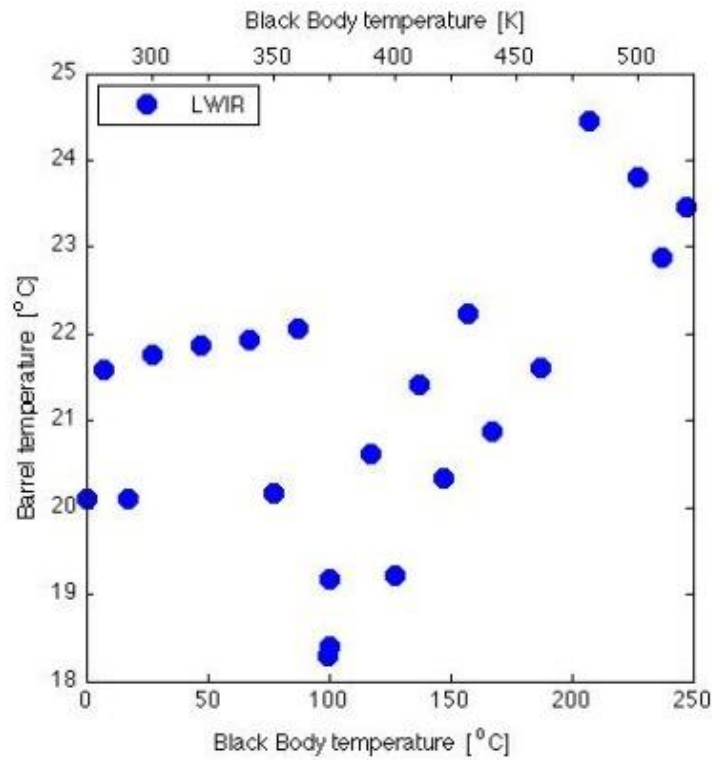


# NIRST EM@IAR NIRST FM@CSC

Cold Sky Calibration  
&  
Radiometric calibration

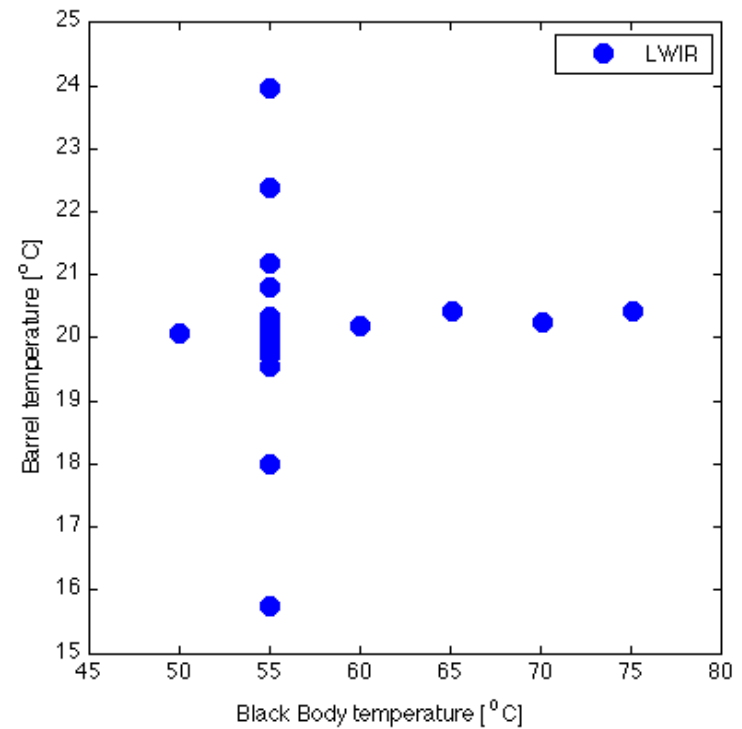
# Correlation

FM@GEMA(2009)



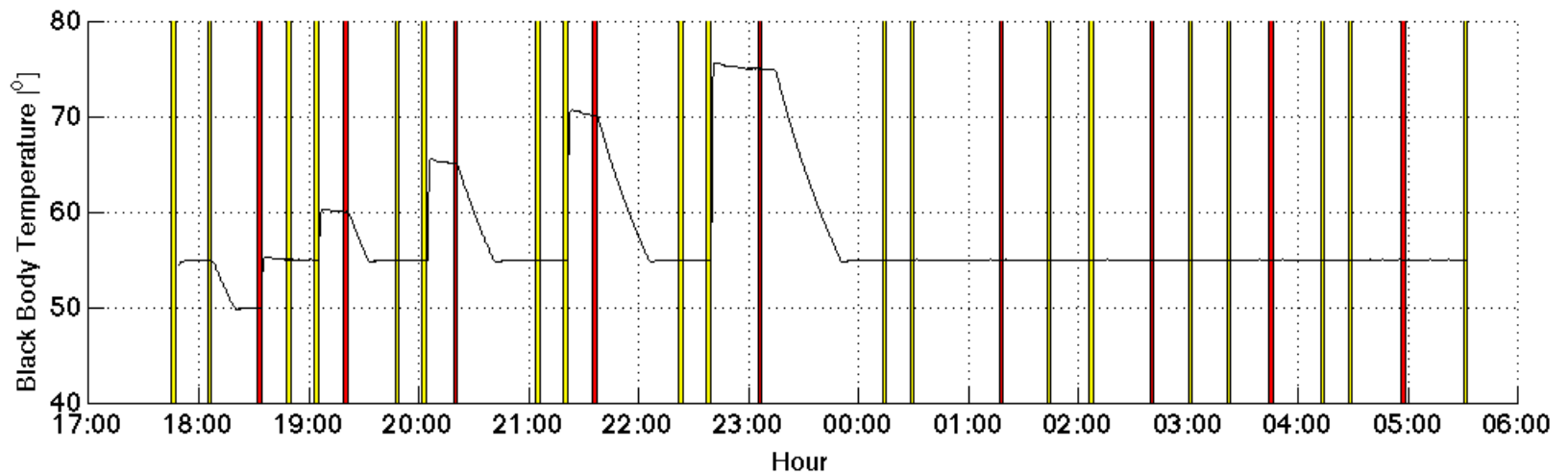
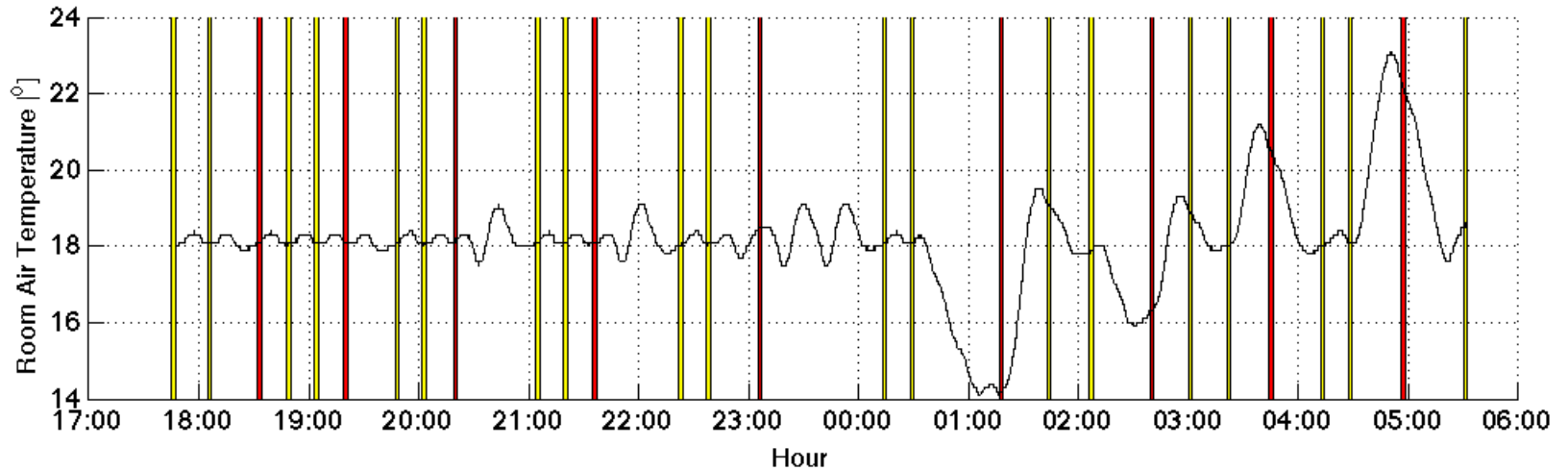
R = 0.50

EM@IAR(2013)

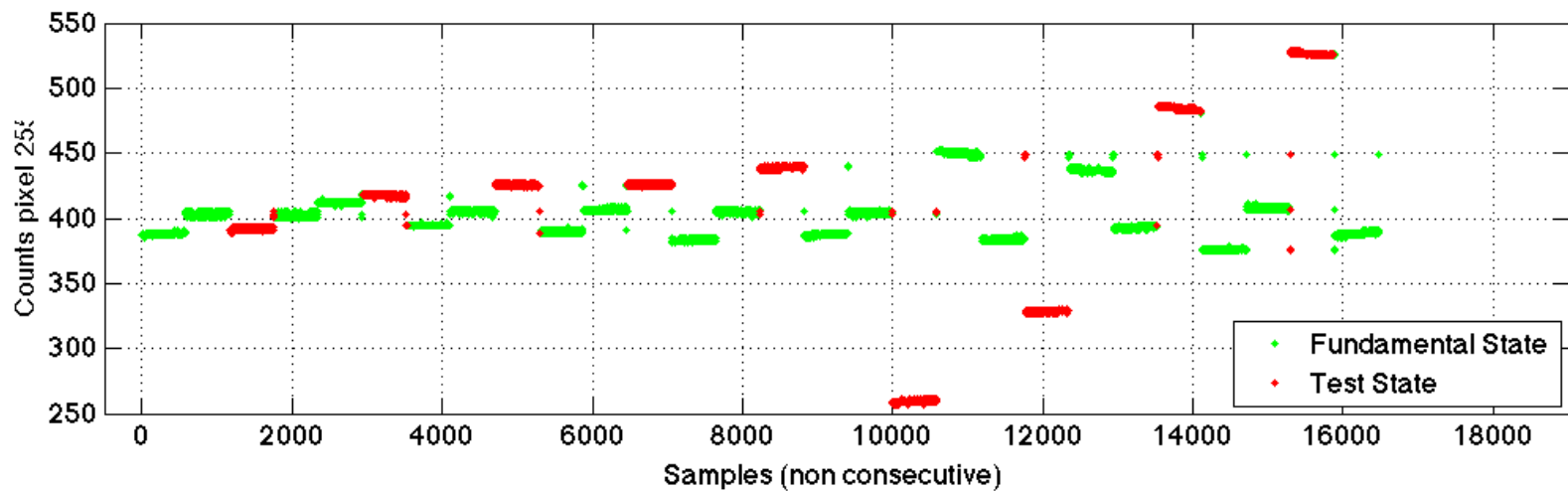
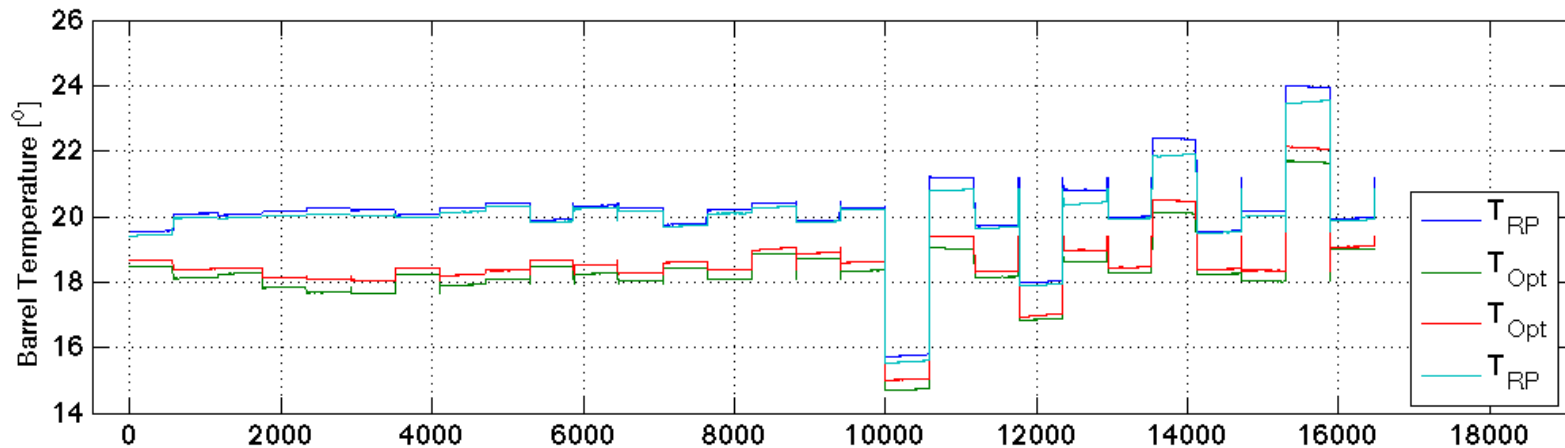


R = 0.05

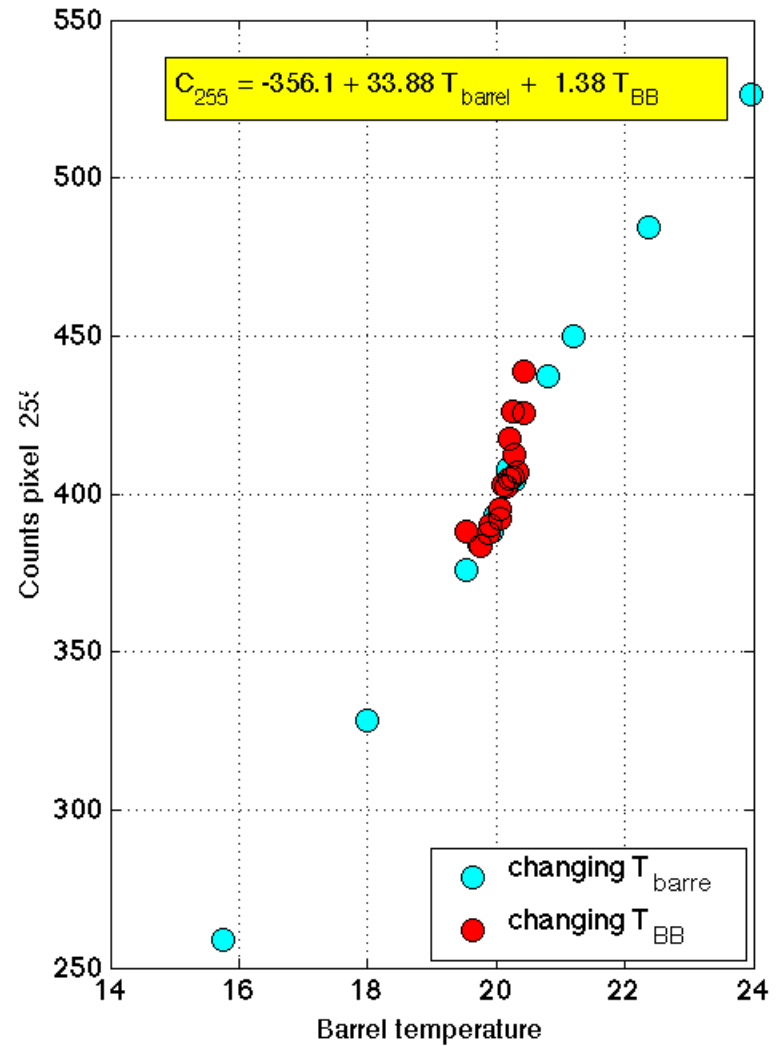
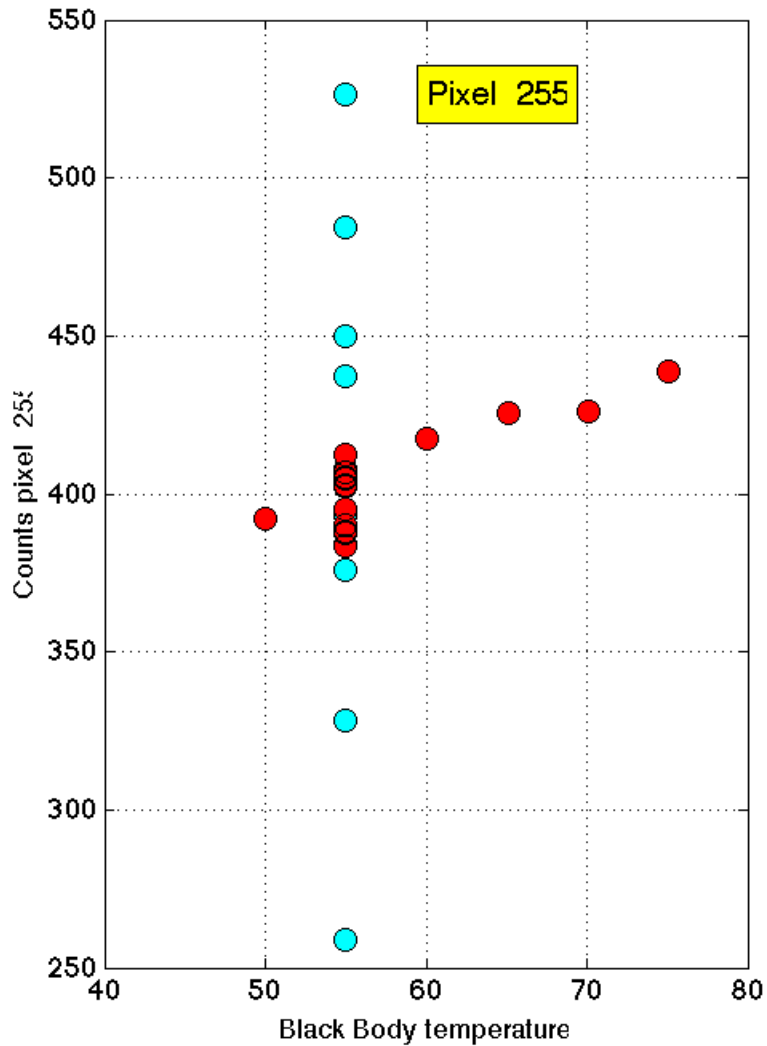
# Temperature Run



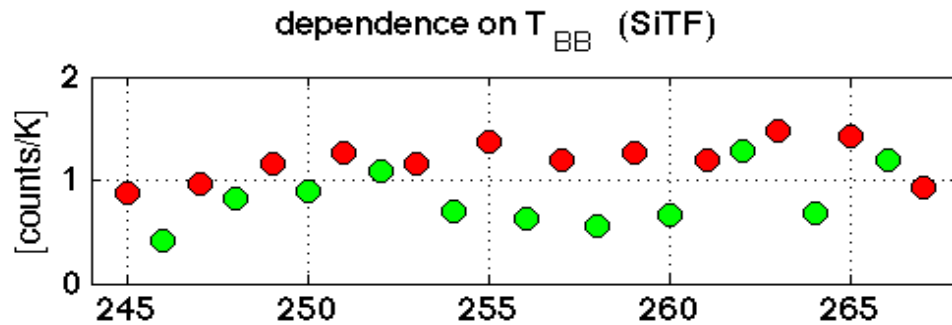
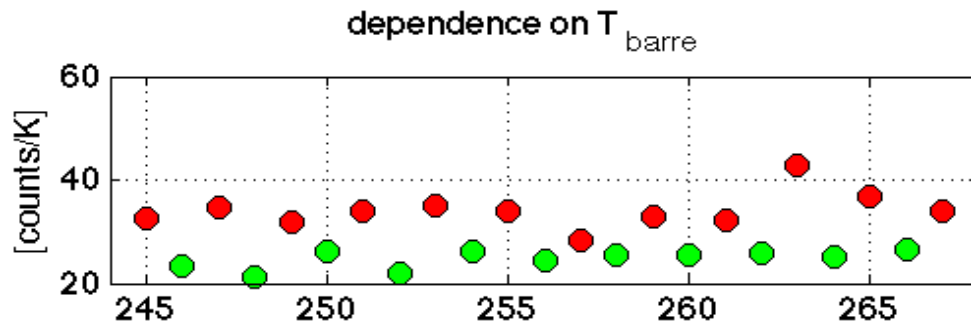
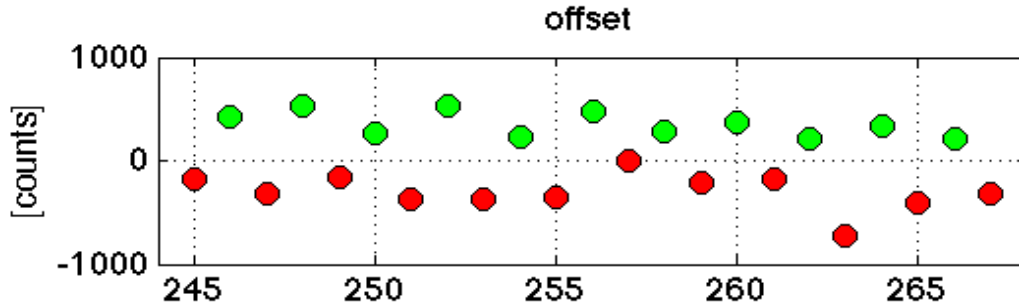
# Samples



$$T_{\text{barrel}} - T_{\text{BB}} - C_{255}$$

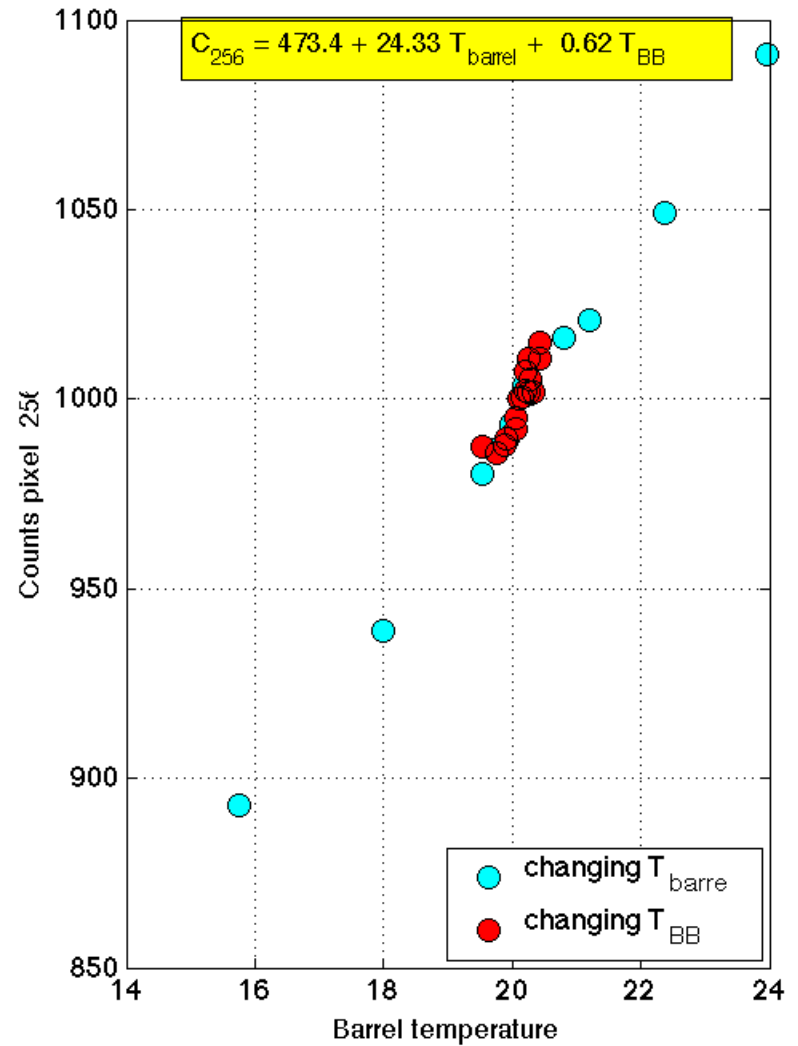
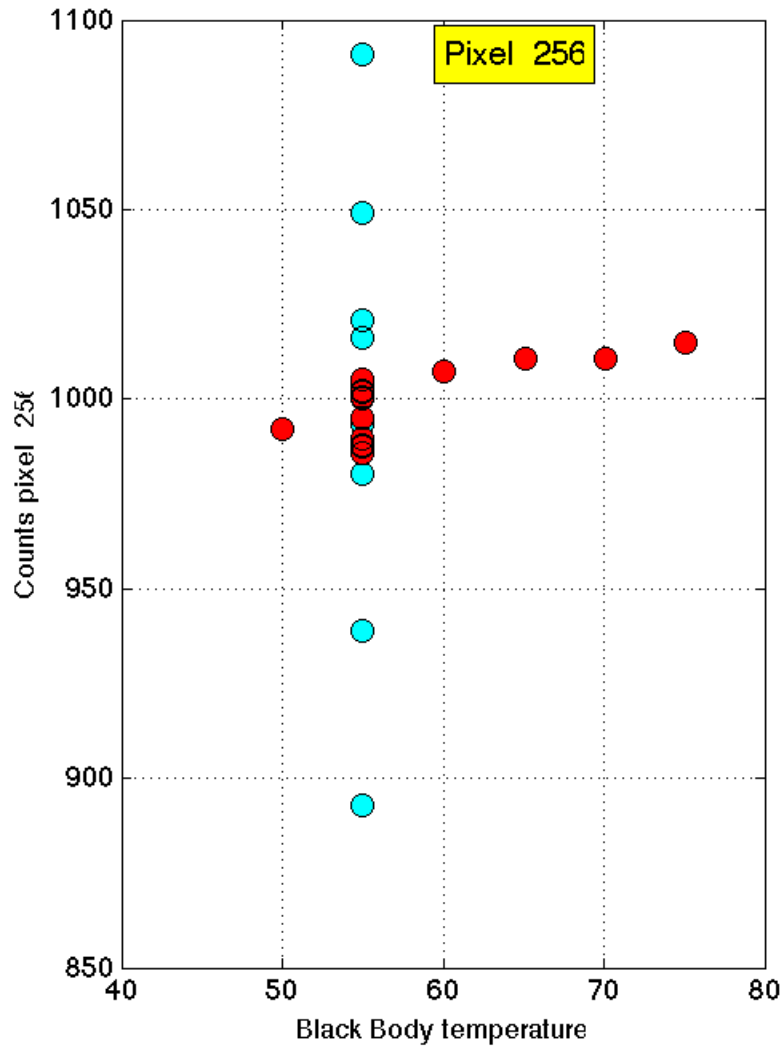


$$\text{Counts} = \text{offset} + C_b T_{\text{barrel}} + C_{\text{BB}} T_{\text{BB}}$$

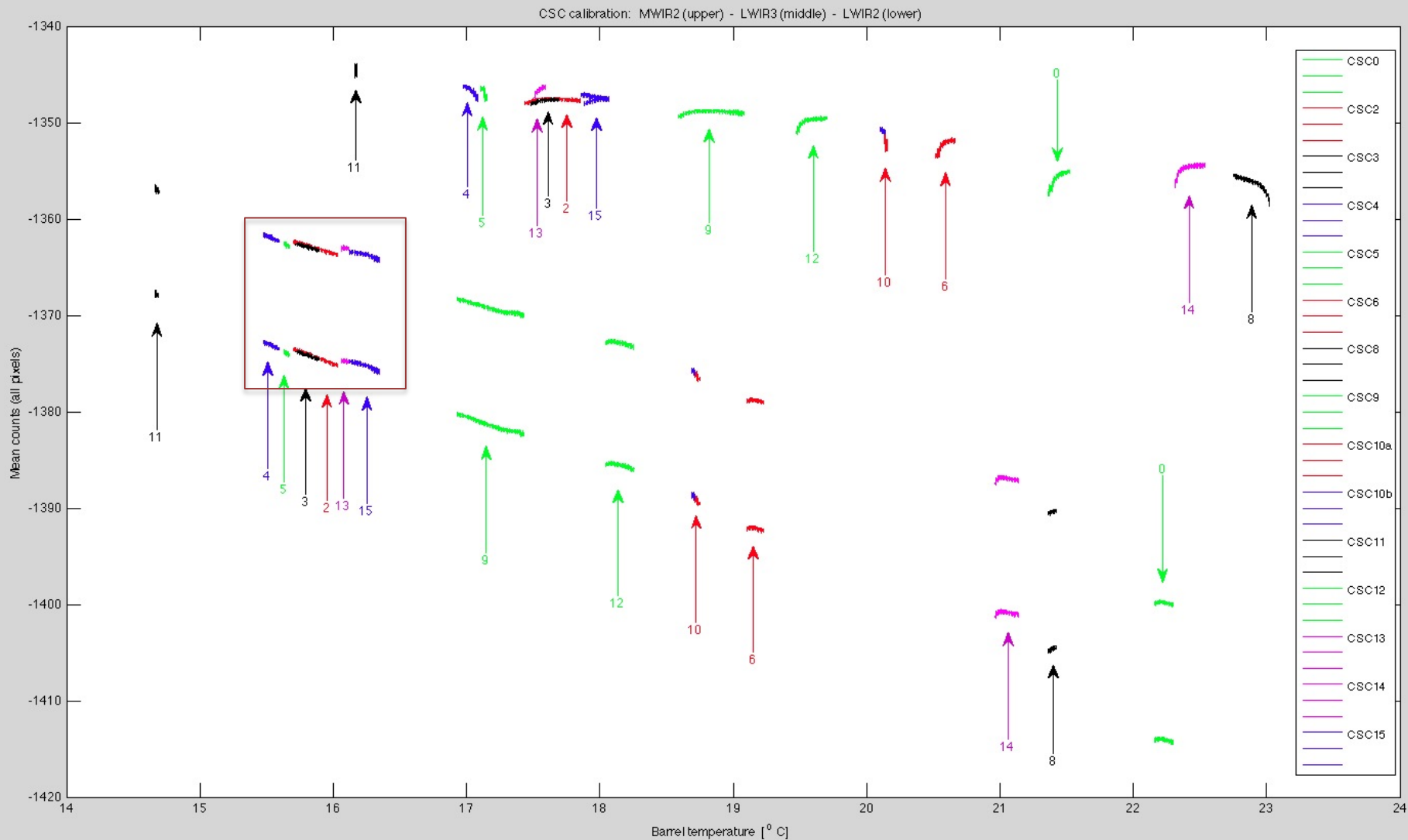


Pix	offset	$T_{\text{barrel}}$	$T_{\text{BB}}$
245	-170.3	32.70	0.88
246	432.8	23.40	0.42
247	-324.8	34.84	0.97
248	537.8	21.21	0.83
249	-161.7	31.89	1.16
250	263.1	26.08	0.89
251	-369.0	34.14	1.26
252	533.2	21.89	1.08
253	-371.0	35.11	1.16
254	236.0	26.15	0.70
255	-356.1	33.88	1.38
256	473.4	24.33	0.62
257	2.4	28.46	1.19
258	285.6	25.64	0.56
259	-212.5	32.84	1.26
260	377.6	25.35	0.67
261	-183.1	32.09	1.19
262	215.7	25.94	1.28
263	-718.6	42.87	1.48
264	344.2	25.06	0.68
265	-408.1	36.69	1.43
266	203.8	26.56	1.19
267	-317.7	34.06	0.93

$$T_{\text{barrel}} - T_{\text{BB}} - C_{256}$$

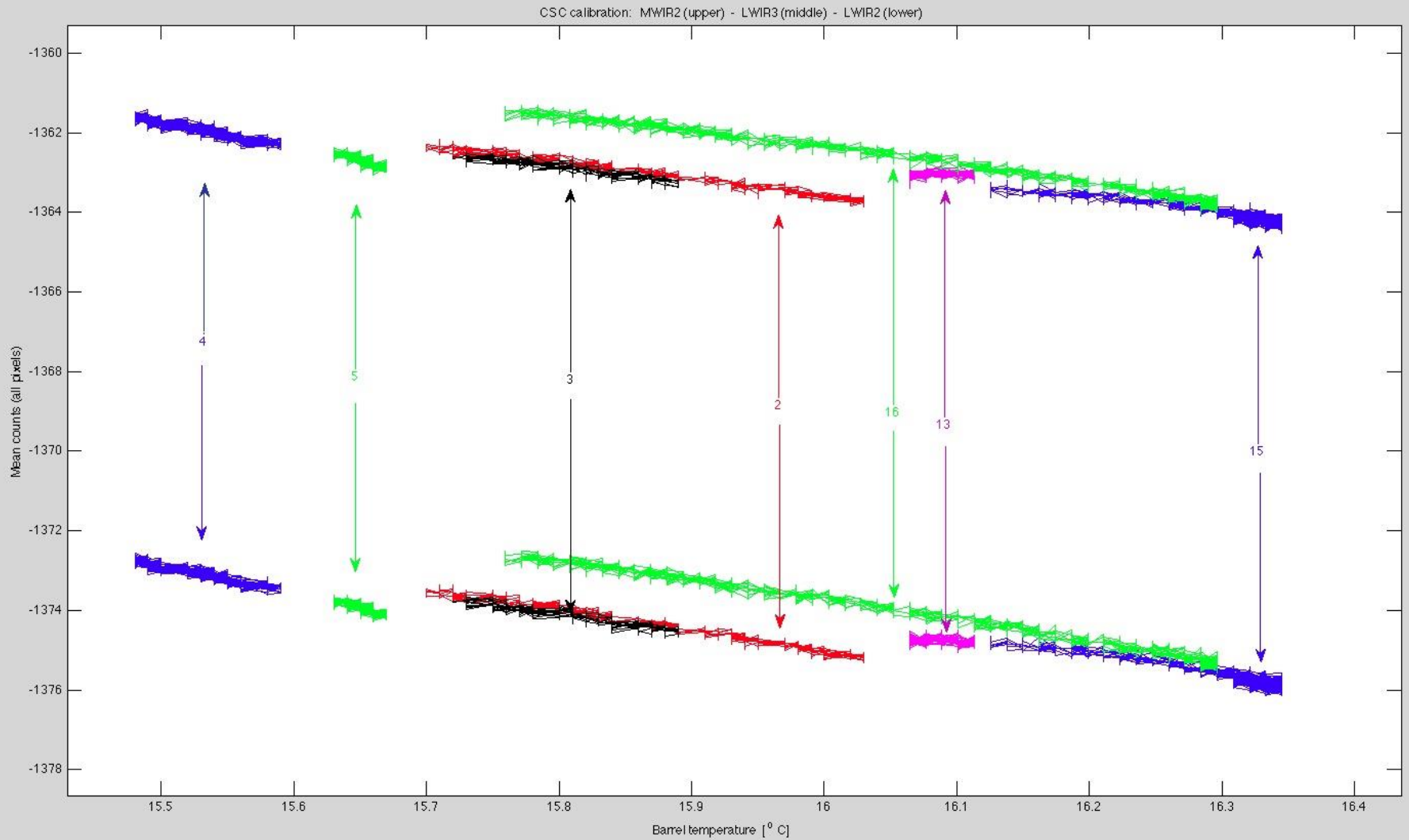


# Cold Sky Calibrations 0-15

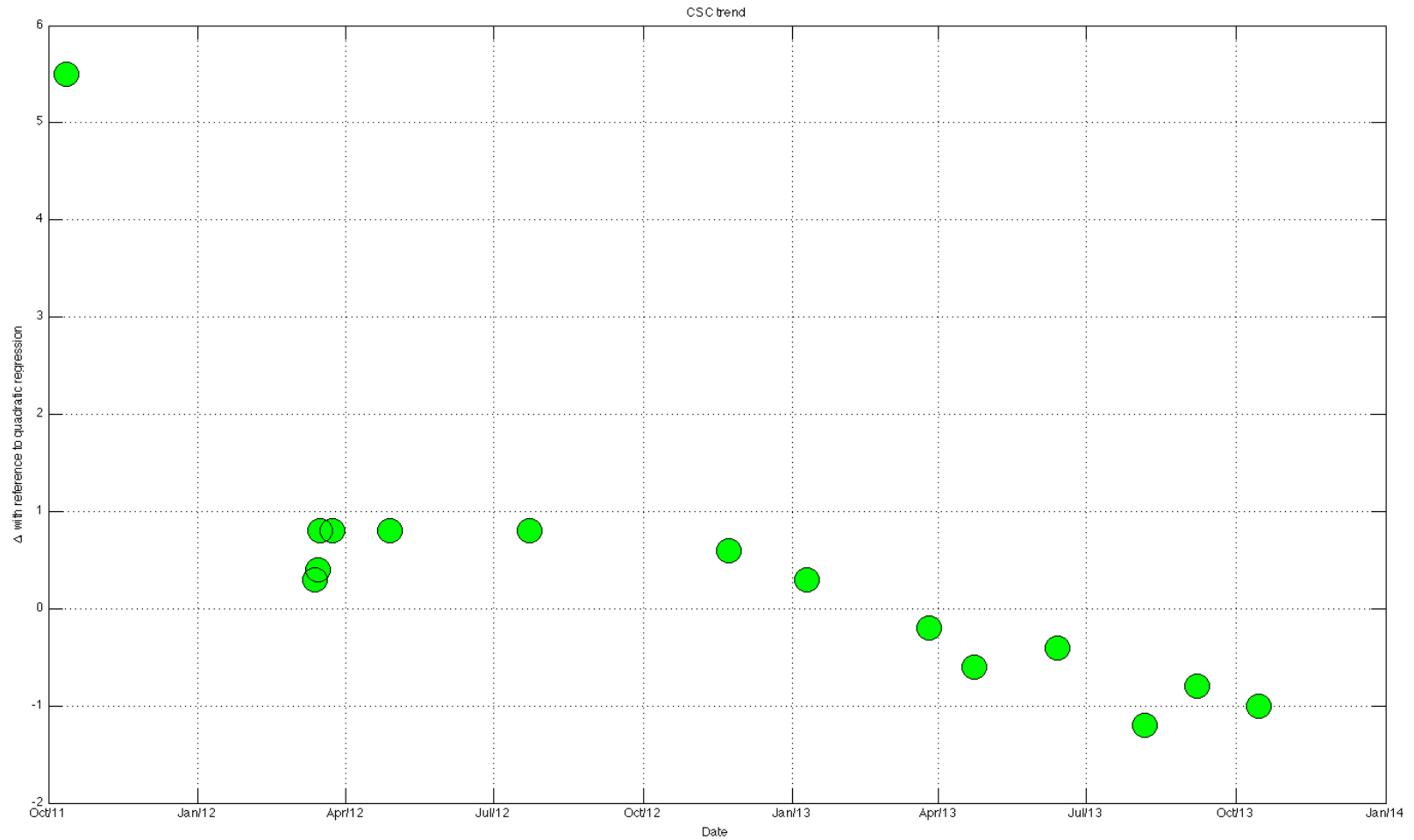




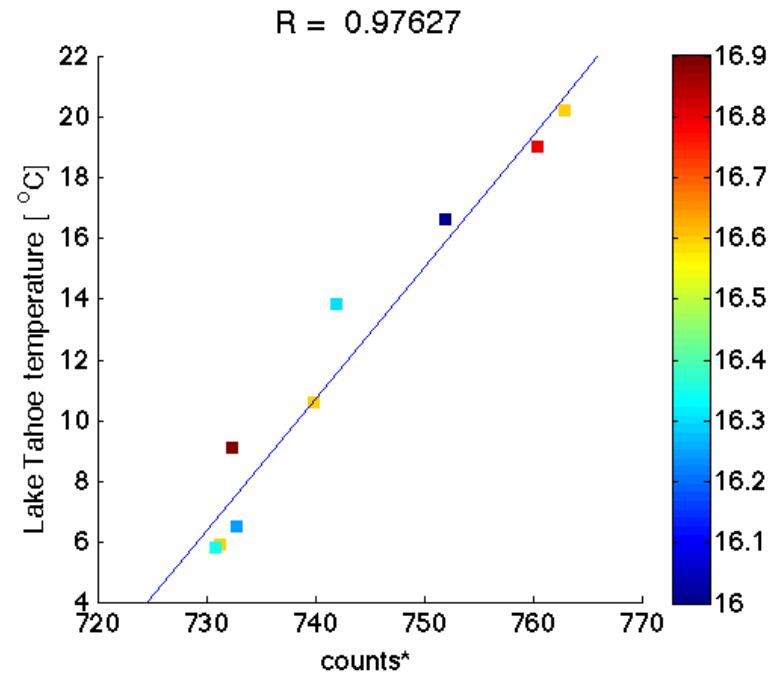
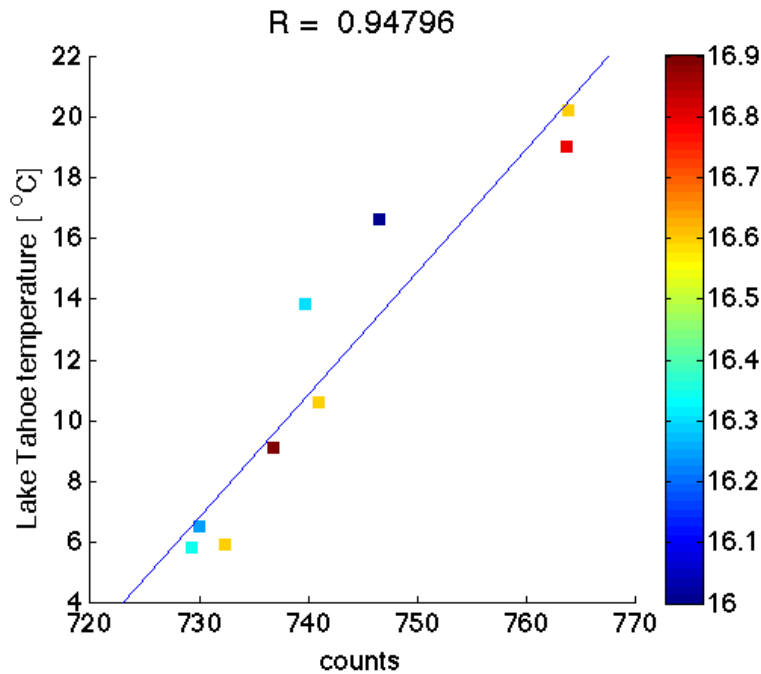
# CSC 0-16 (detail)



# CSC residuals trend



# $T_{\text{Barrel}}$ in absolute calibration



Left: counts as measured

Right:  $\text{counts}^* = \text{counts} - 11 (T_{\text{barrel}} - 16.5)$

# T<sub>Barrel</sub> in absolute calibration

$$P_{total} = P_{barril} + P_{target}$$

$$DN(P_{total}) \neq DN(P_{barril}) + DN(P_{target})$$

*porque*

$$P_{total}(DN) = \sum_{i=0}^n A_i DN^i$$

Las potencias incidentes se suman pero la relación funcional que vincula potencia incidente con las cuentas no es lineal.

Entonces no podemos linearizar el problema de separar las cuentas del fondo (producidas por la radiación del barril) de las cuentas netas debidas solamente a la radiación del target.

En otros términos, adoptar la pendiente de la relación funcional que vincula  $P_{total}$  con DN medida en una zona para corregir los valores en otra conduce a errores.

Véase la figura de la siguiente diapo.

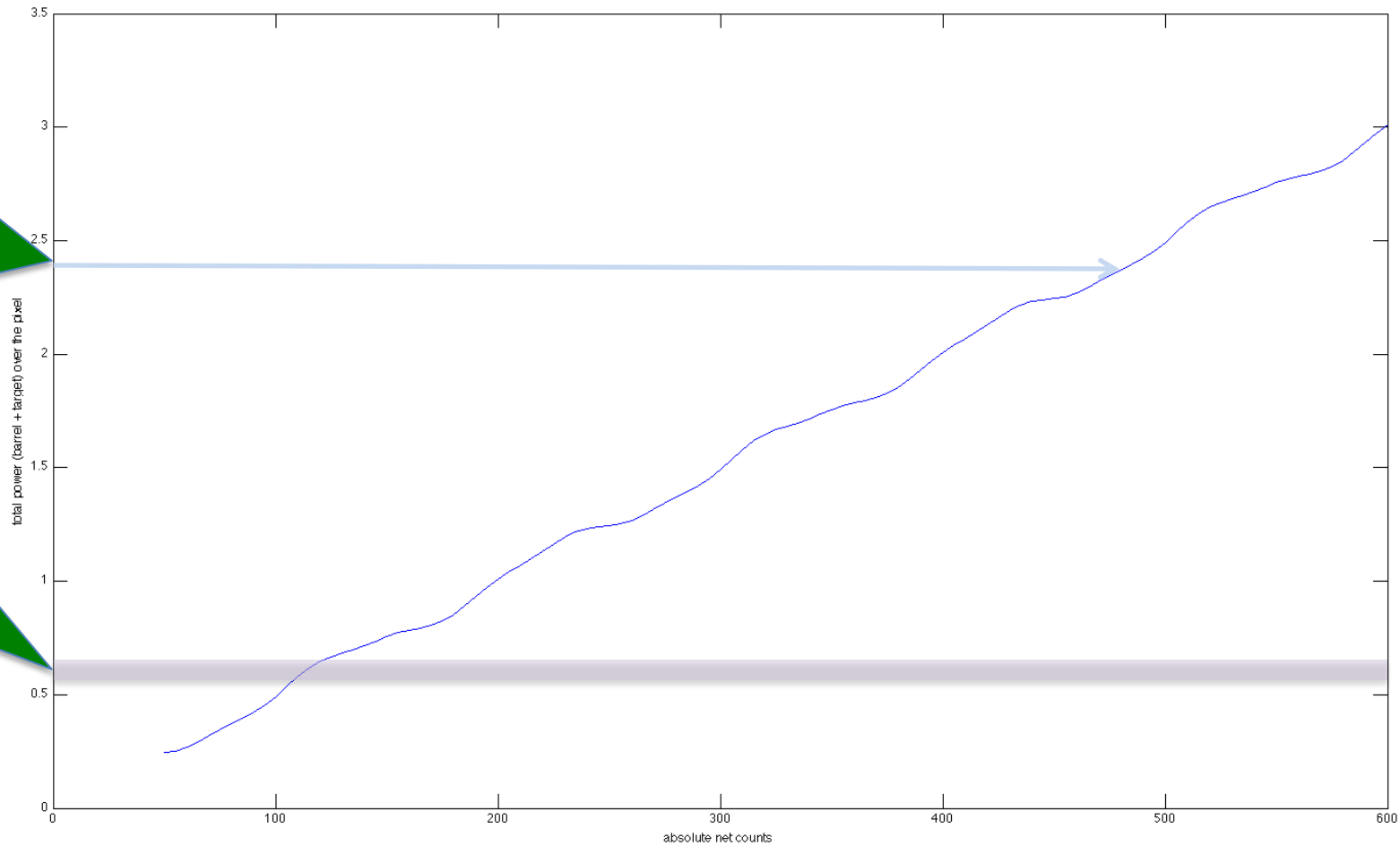
También de esa figura se desprende que comparar la pendiente promedio total con la pendiente en un rango restringido como es el señalado en la figura debe mostrar una correlación floja. (comparación hecha para los 512 pixels)

Sin embargo ... linearizar es la única vía posible para acercarse a una solución.

Un pixel cualquiera (son todos distintos)

Las pendientes en ambas zonas son distintas

*Diagrama esquemático en nW vs counts*

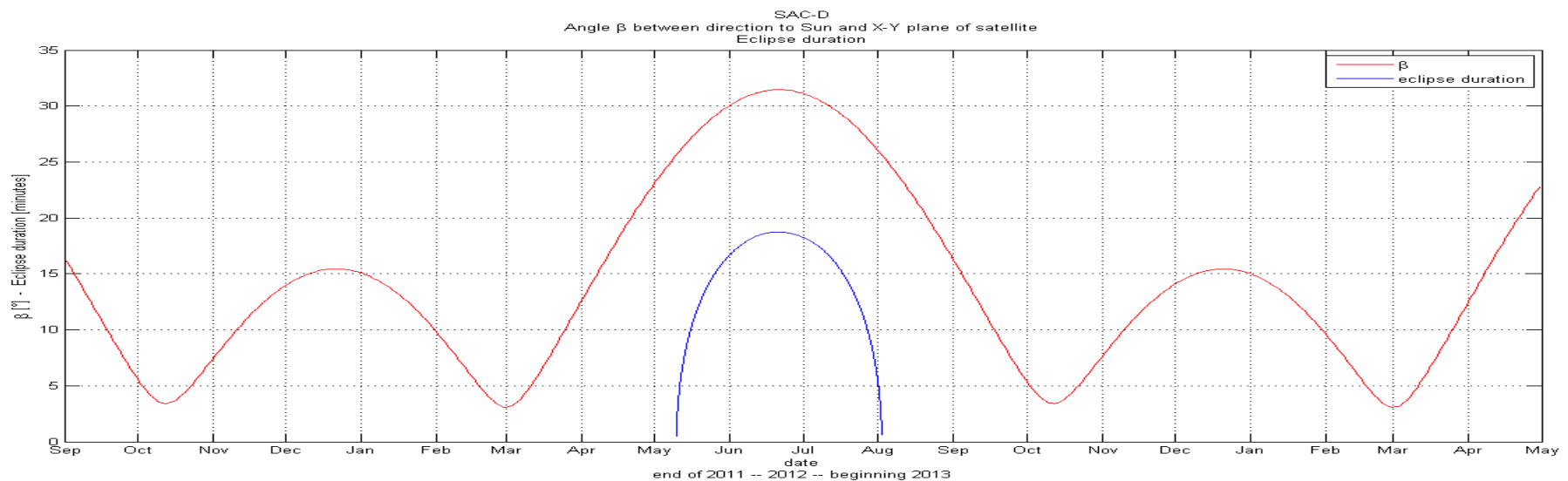
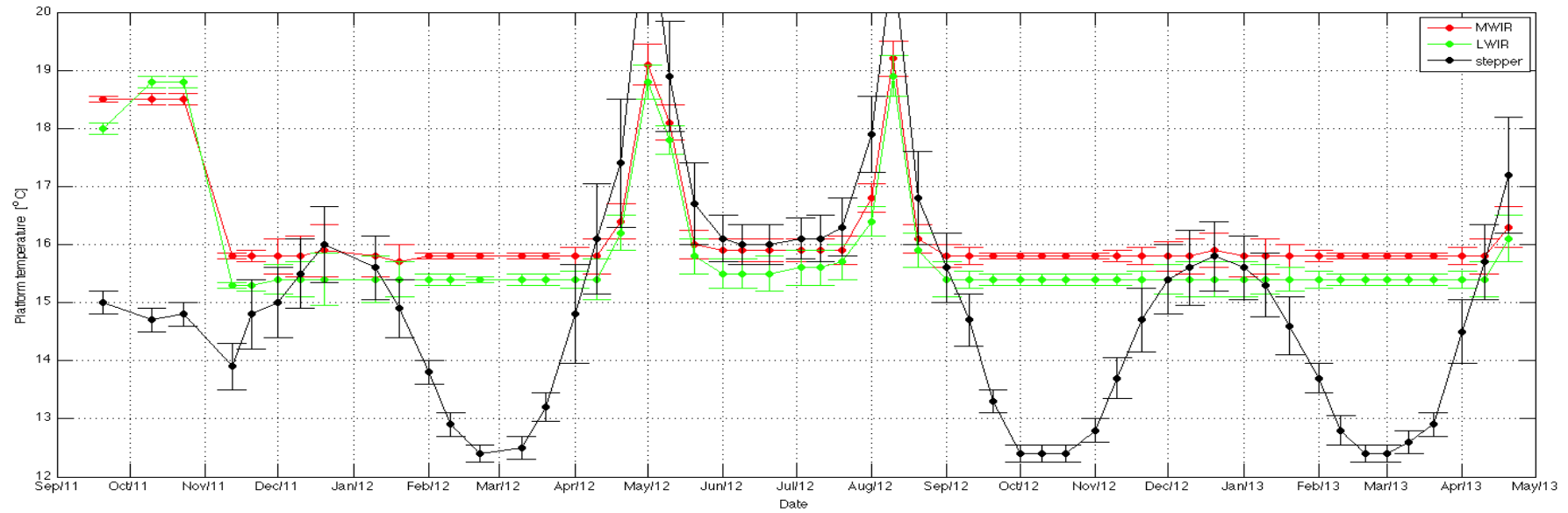


Potencia total (barril + target) que queremos corregir por la radiación del barril

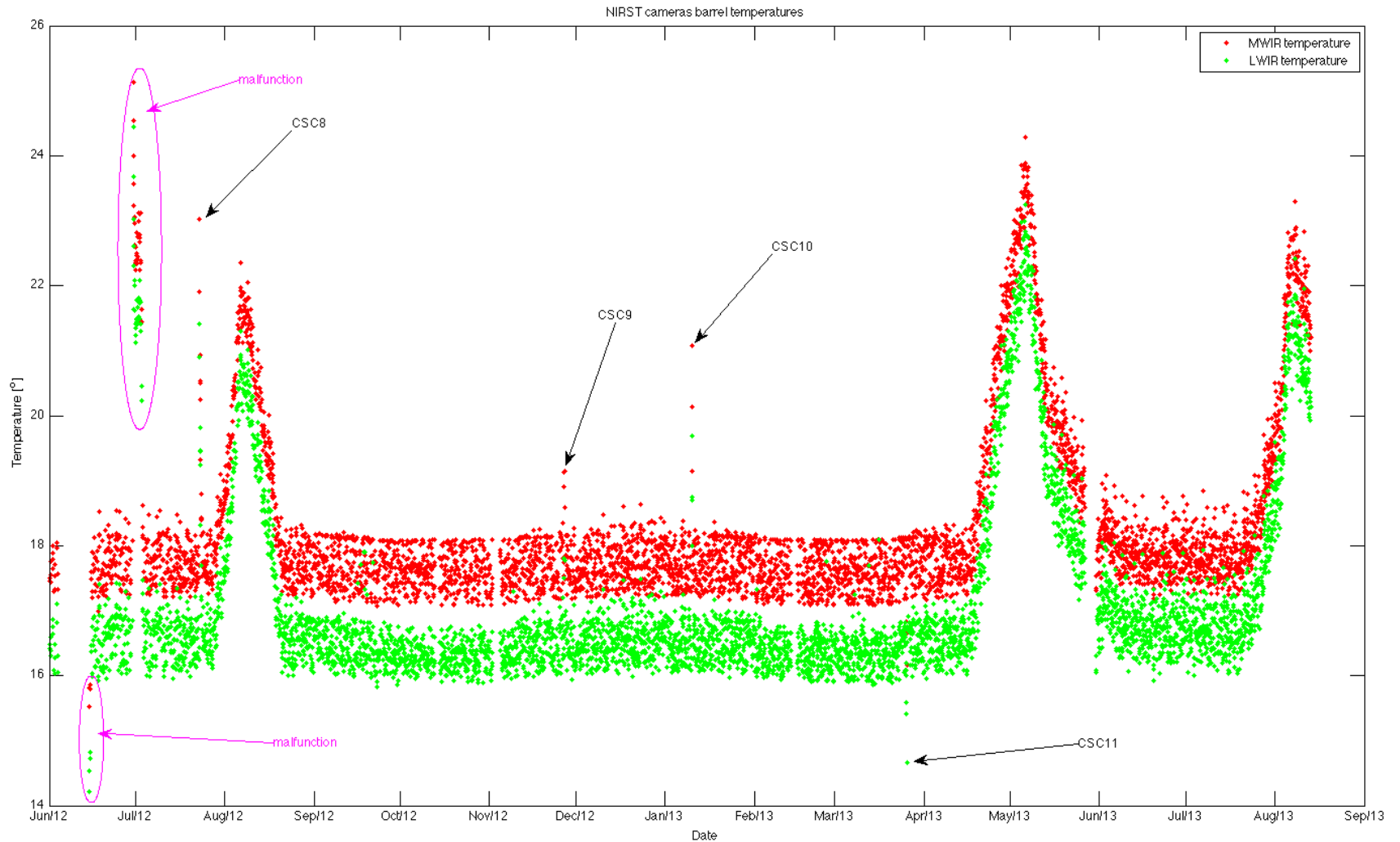
Rango de potencias correspondiente a la radiación proveniente del barril

# NIRST space weather

(platform telemetry)



# NIRST space weather (NIRST telemetry)



# Embalse Rio Tercero

A brief example (using counts) that compares brightness temperatures with color temperatures.

The later is “almost” independent of emissivity and atmospheric transmission

$C_{12\mu\text{m}}$

$C_{11\mu\text{m}} - C_{12\mu\text{m}}$

$C_{11\mu\text{m}}$

