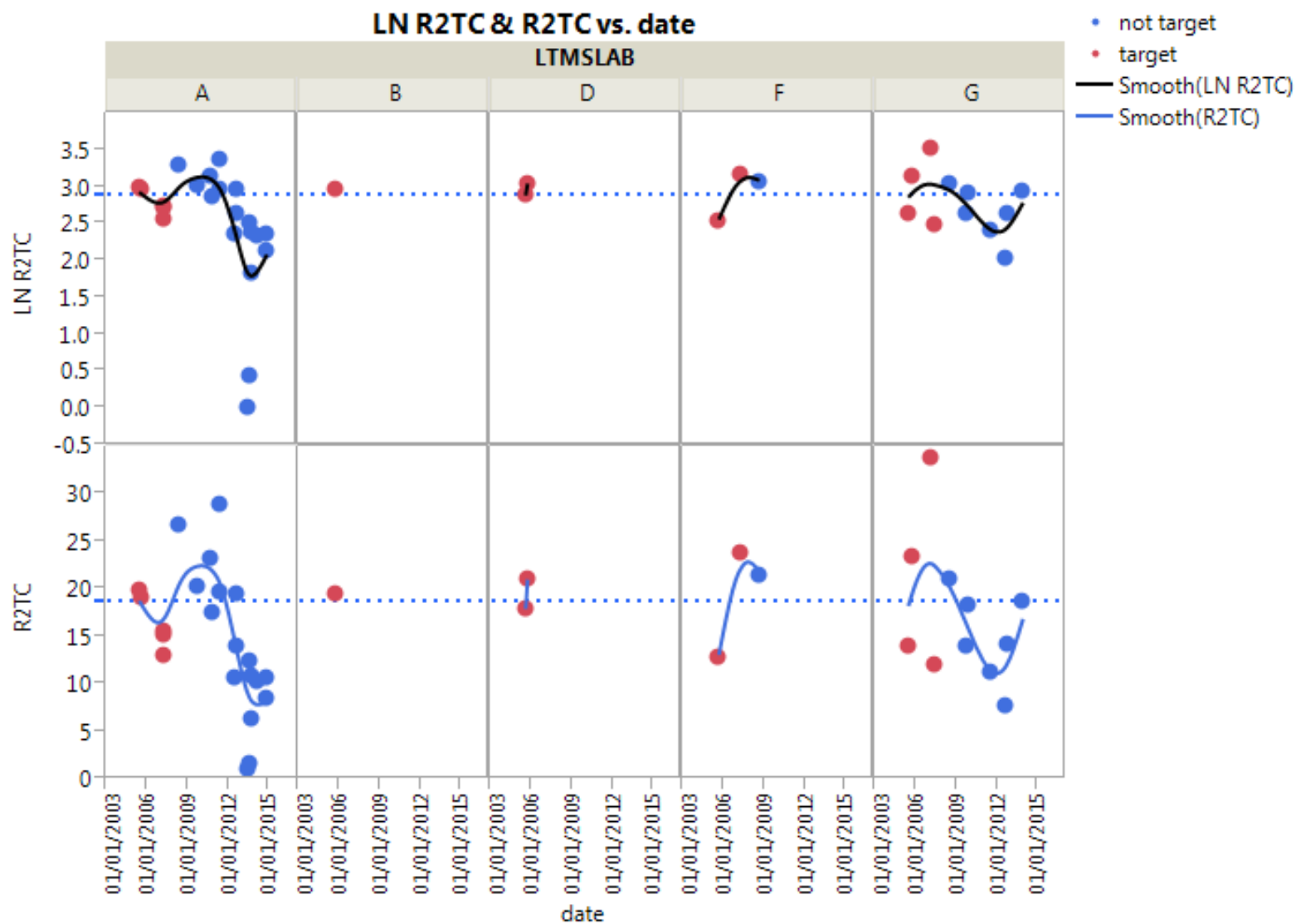


# C13: 2<sup>nd</sup> Ring Top Carbon Reference data

Elisa Santos  
11/20/2014

- After analyzing the R2TC data, I would like to share with you a few thoughts
  - I would like to show you a few plots again
  - I would like to ask the TMC to post piston data for 2014 tests (3 tests plus 1 from Lab G that did not EOT yet)
  - Before we discuss potential correction factors, please, wait to get the test result from Lab G expected to EOT on Friday, 21<sup>st</sup>.

# Recent data are generated by Labs A and G



# Means and Standard deviations



Oil 831  
Chart = Yes  
Removing  
Two tests  
From lab A

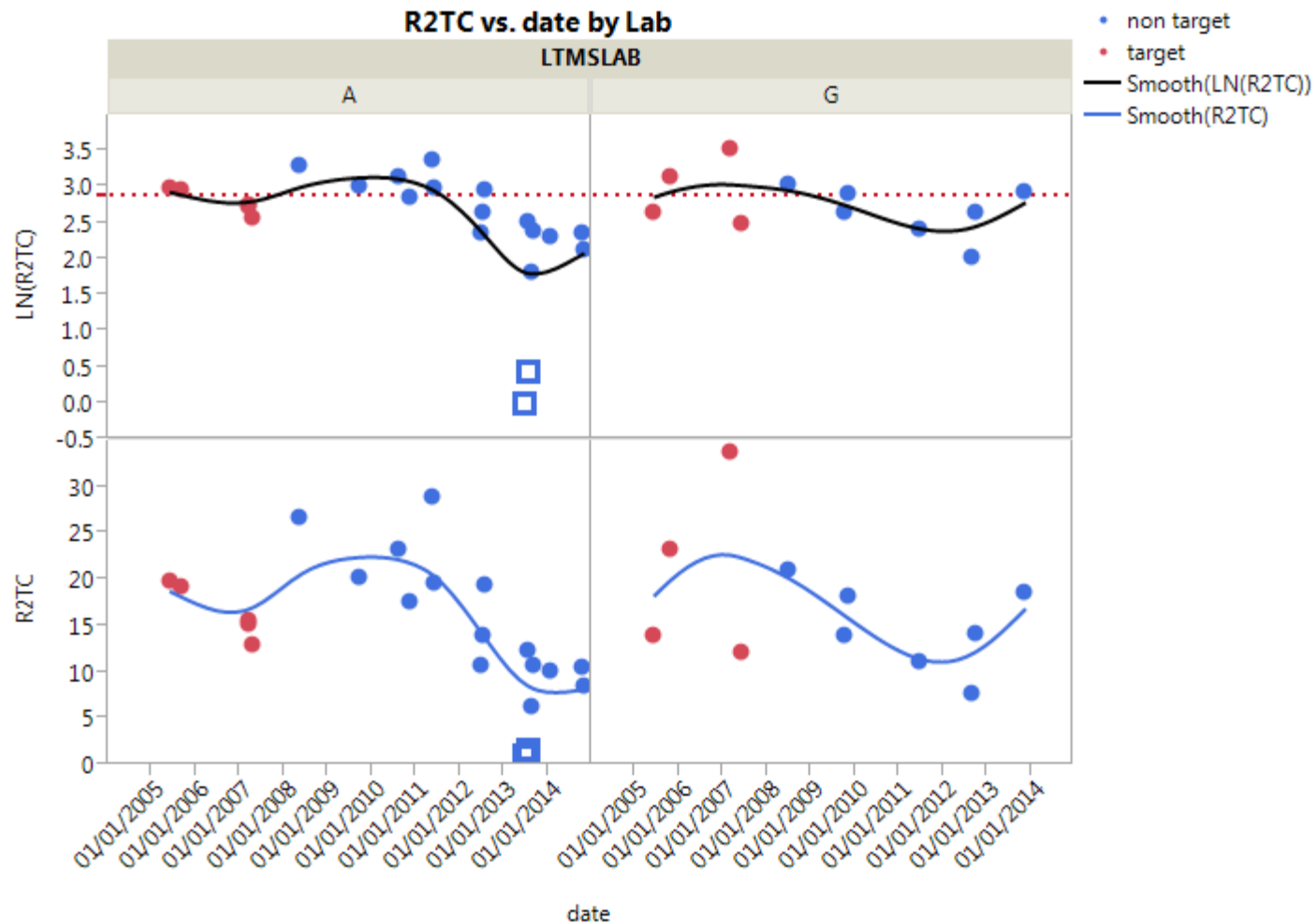
factor 2	LTMSLAB	N Rows	Mean(LN(R2TC))	Std Dev(LN(R2TC))
target	A	5	2.7913	0.1779
target	B	1	2.9642	
target	D	2	2.9662	0.1135
target	F	2	2.8550	0.4421
target	G	4	2.9491	0.4751
before 2013	A	9	2.9570	0.3103
before 2013	F	1	3.0662	
before 2013	G	6	2.6140	0.3590
after	A	6	2.2532	0.2426
after	G	1	2.9291	

SECOND RING TOP CARBON  
Unit of Measure: LN (Demerits)

From LTMS

Reference Oil	Mean	Standard Deviation
831	2.8828	0.2900
831-1	2.8828	0.2900
831-2	2.8828	0.2900

# Labs A and G only: PC-10B, 831, 831-1 and 831-2

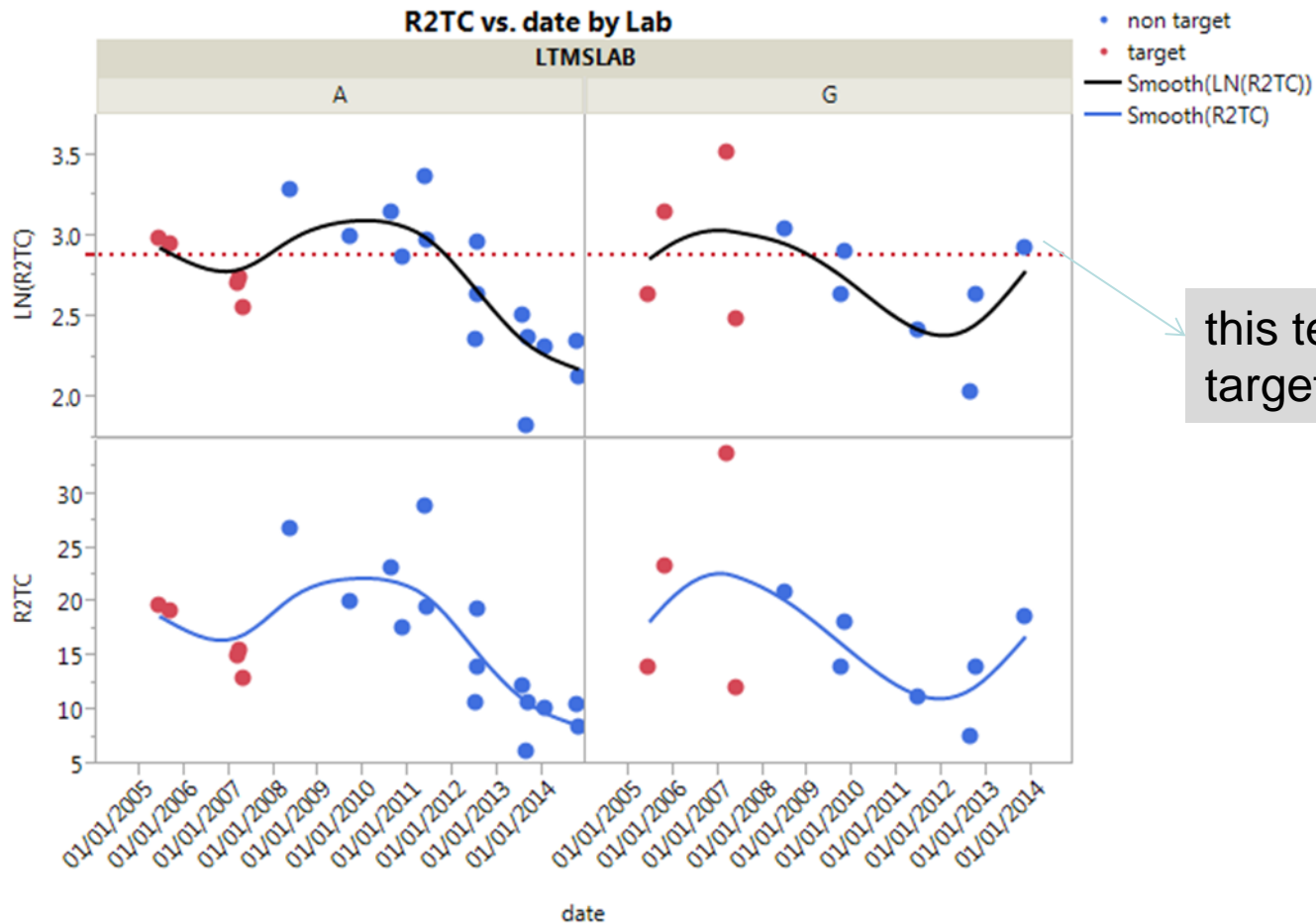


# Labs A and G only: PC-10B, 831, 831-1 and 831-2



factor 2	LTMSLAB	N Rows	Mean(LN(R2TC))	Std Dev(LN(R2TC))
target	A	5	2.7913	0.1779
target	G	4	2.9491	0.4751
before 2013	A	9	2.9570	0.3103
before 2013	G	6	2.6140	0.3590
after	A	6	2.2532	0.2426
after	G	1	2.9291	

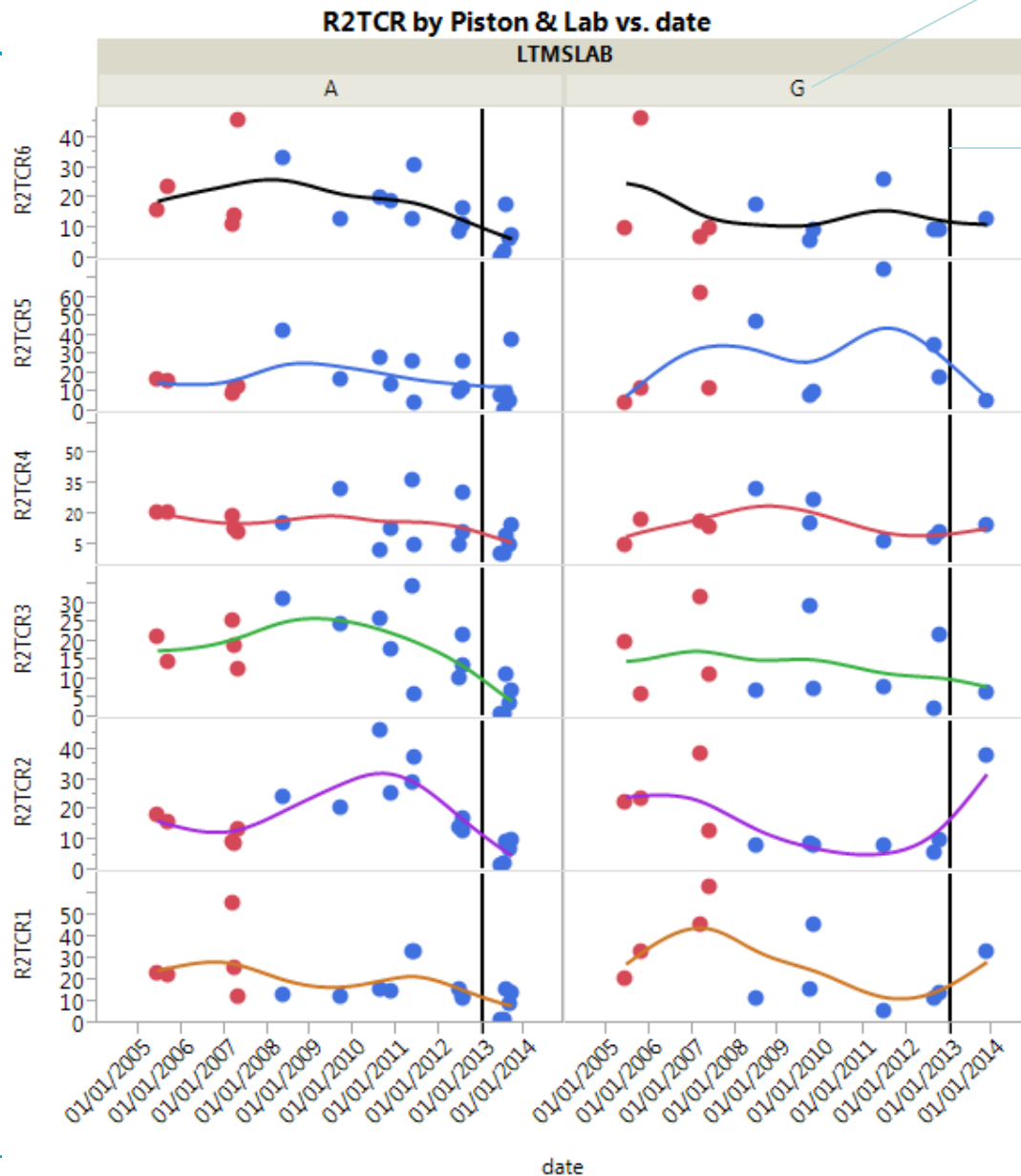
# Labs A and G only – after removing the highlighted lower test results



# Piston data up to end of 2013

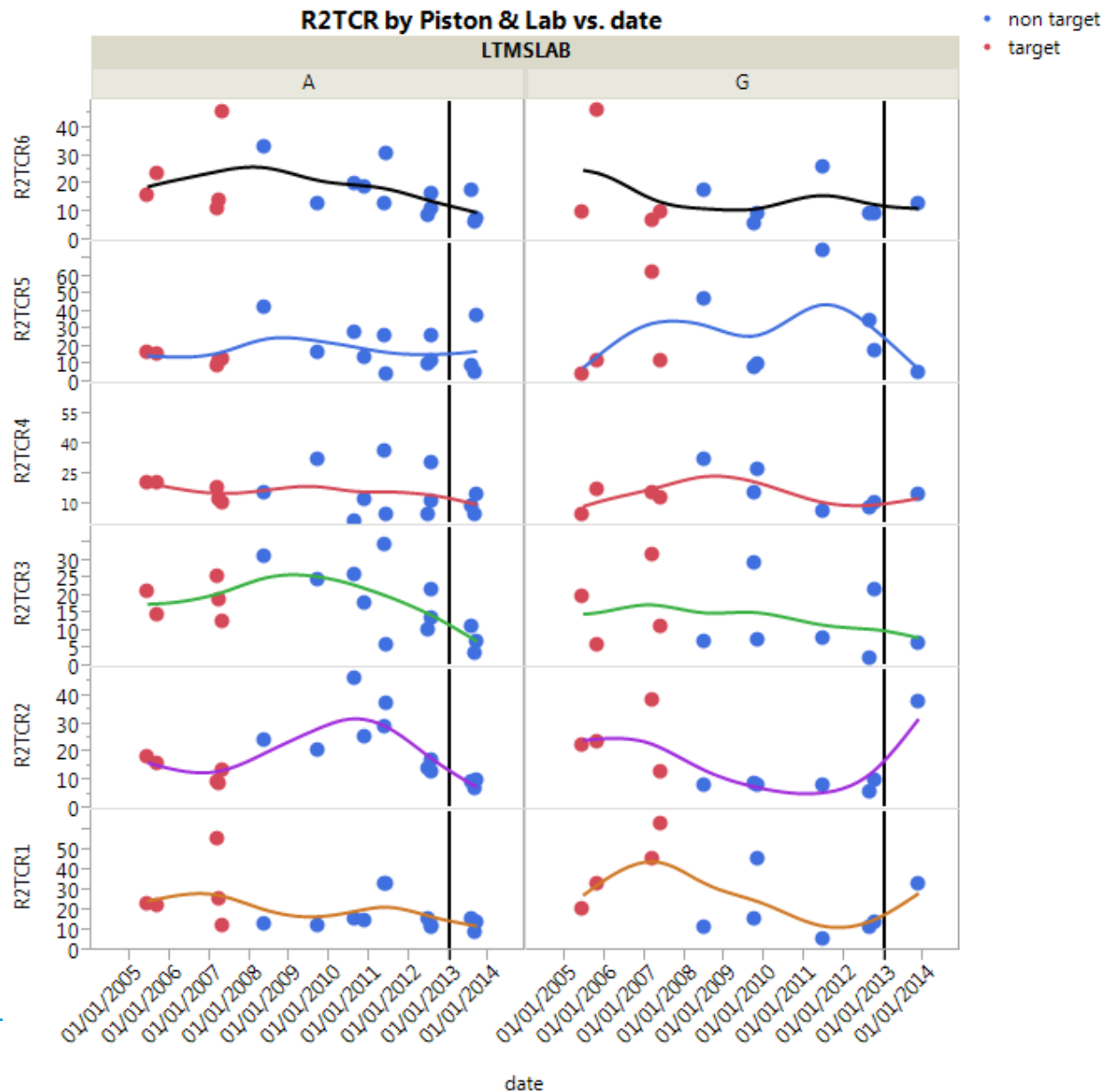
One test in 2013

2013 starts





# Piston data up to end of 2013



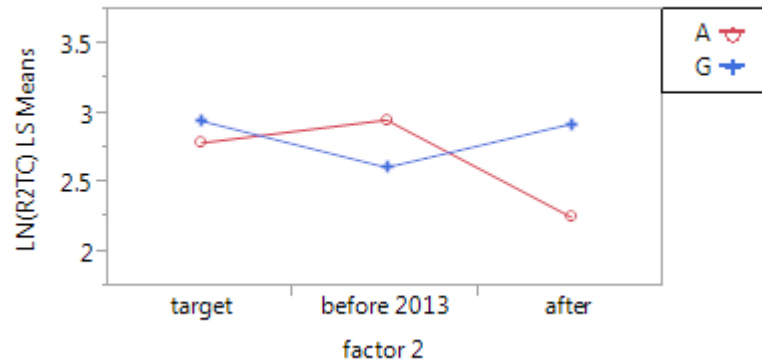
After  
removing  
the  
highlighte  
d low tests  
results

# Average differences (LN R2TC): eliminating two tests highlighted earlier

Models: Lab, time factor and interaction Lab \* time factor

Time factor: (one with three levels -- "Target", "Before 2013" and "2013 or later"; the other with two levels "Before 2013" and "2013 or later")

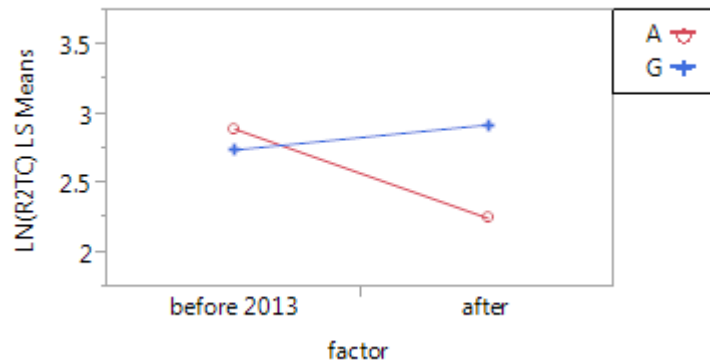
LS Means Plot



Level		Least Sq Mean
A, before 2013	A	2.9570386
G, target	A	2.9490872
G, after	A B	2.9290581
A, target	A B	2.7912867
G, before 2013	A B	2.6140110
A, after	B	2.2532133

Levels not connected by same letter are significantly different.

LS Means Plot



Level		Least Sq Mean
G, after	A B	2.9290581
A, before 2013	A	2.8978415
G, before 2013	A	2.7480415
A, after	B	2.2532133

Levels not connected by same letter are significantly different.

0.644

Lab A, not G

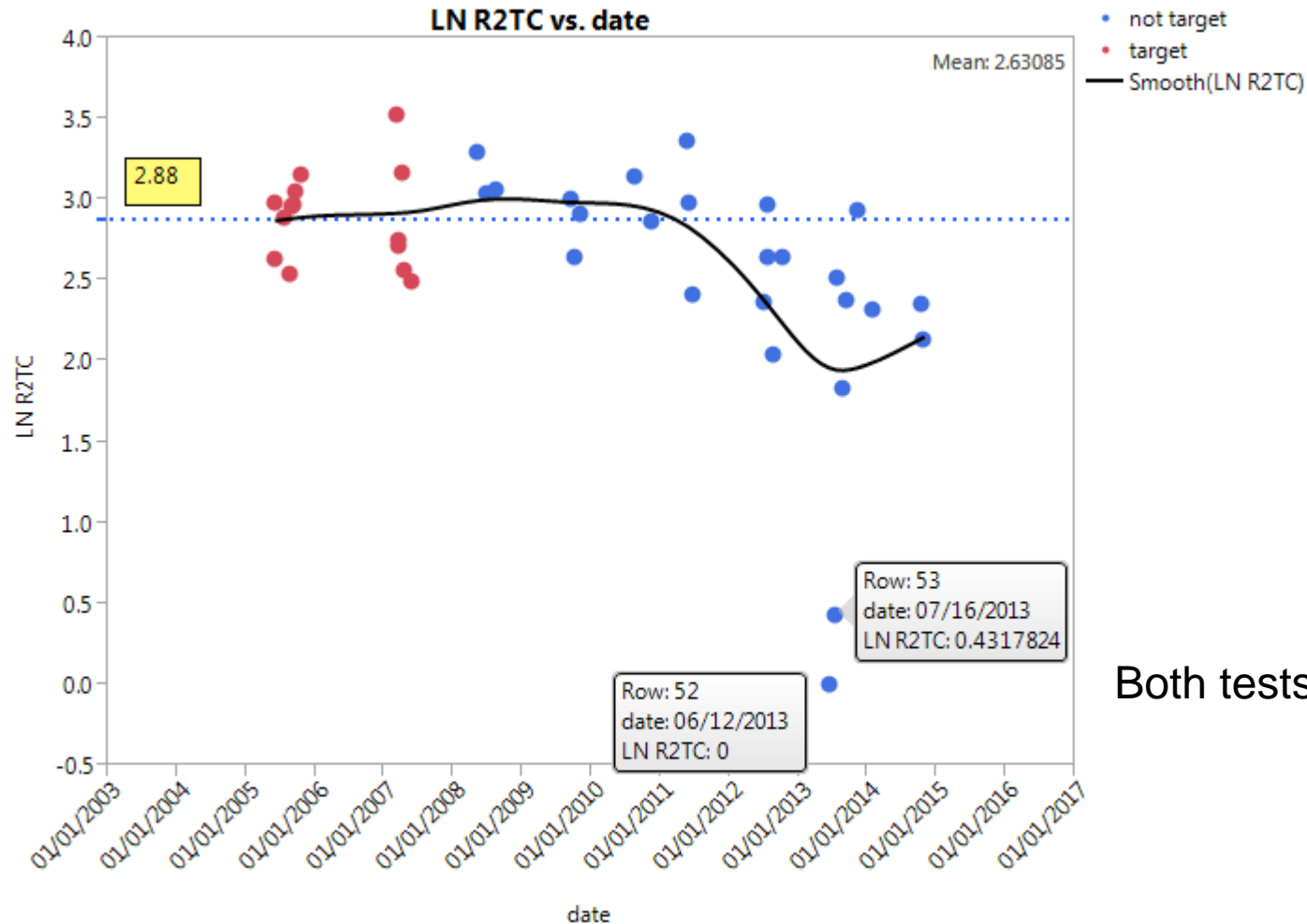
SECOND RING TOP CARBON  
Unit of Measure: LN (Demerits)

Reference Oil	Mean	Standard Deviation
831	2.8828	0.2900
831-1	2.8828	0.2900
831-2	2.8828	0.2900

## Usable data for analysis

LTMSLAB	factor 2	N Rows
A	target	5
A	before 2013	9
A	after	6
B	target	1
D	target	2
F	target	2
F	before 2013	1
G	target	4
G	before 2013	6
G	after	1
H	before 2013	1

# 2<sup>nd</sup> Ring Top Carbon: transformed values over time



Both tests in lab A

