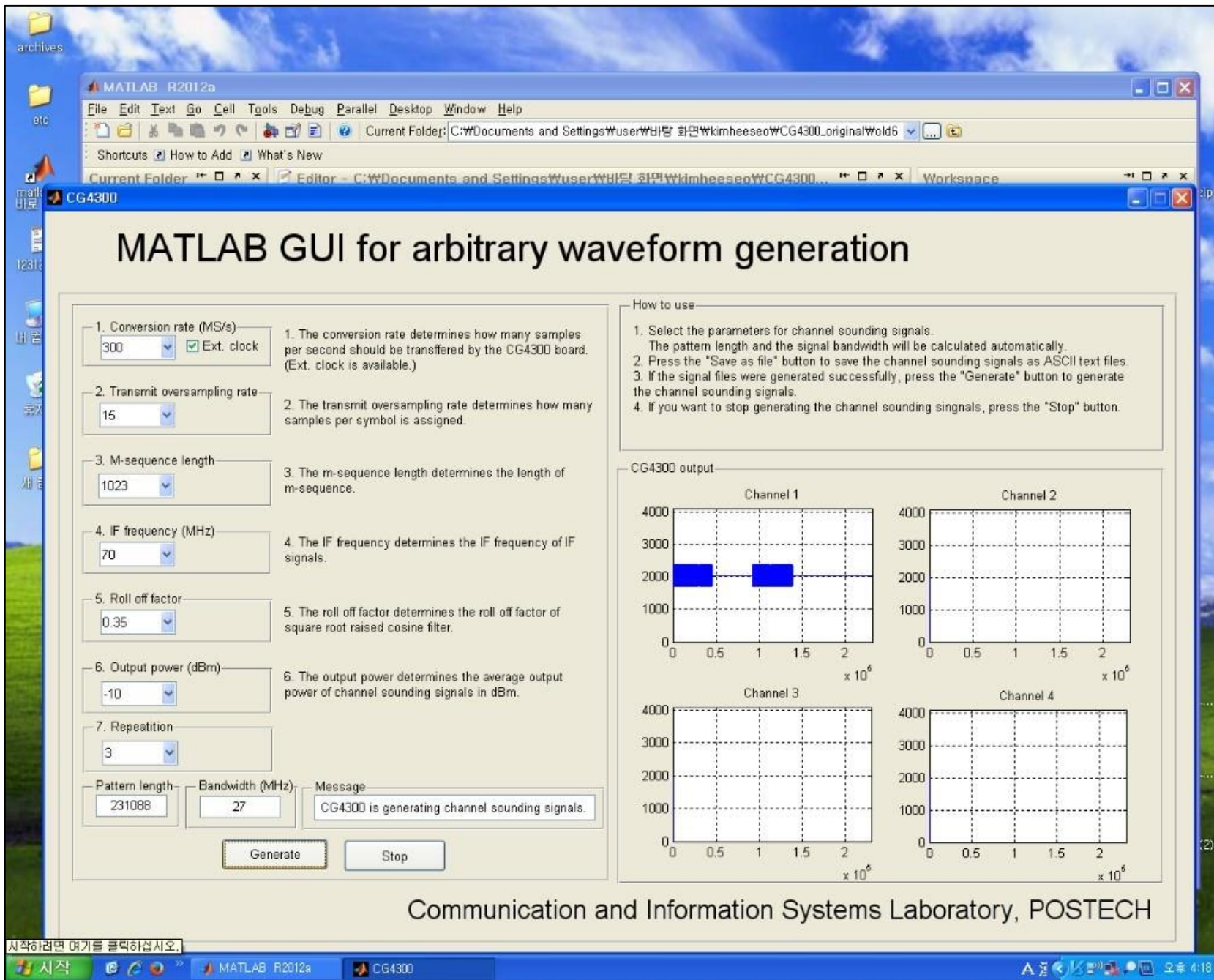


# Phase error



**CompuGen**  
- IF Frequency : 70MHz

# MATLAB GUI for Signal Acquisition (CSE1242\_2th)

## COMPU-SCOPE

Transmit signal parameters

Conversion rate (MS/S)

300

Mseq\_length

1023

Transmit oversampling rate

15

Roll off factor

0.35

1. Sampling Rate (MS/s)

200

☒ Ext.clock

1. The sampling rate determines how many samples per second will be sampled by the CSE1242 board.

2. Voltage level (Volt)

0.1

2. The voltage level determines the input voltage level of CSE1242 board.

3. Number of acquisition

1

fast

3. The number of acquisition determines the number of acquisitions.

4. Transmit antenna spacing (cm)

2

5. Receive antenna spacing (cm)

2

6. Transmit antenna spacing (cm)

환경설정

폴더생성

Message

while ing

Preview

Stop preview

Record for offline processing

Record and online processing

How to use

1. Select the parameters for signal acquisition.

2. Press the "Preview" button to preview the received signal.

3. If you want to stop previewing, press the "Stop preview" button.

4. If you want to save samples as ASCII text files, press the "Save as file" button.

CSE 1242 input

Channel 1



Channel 2

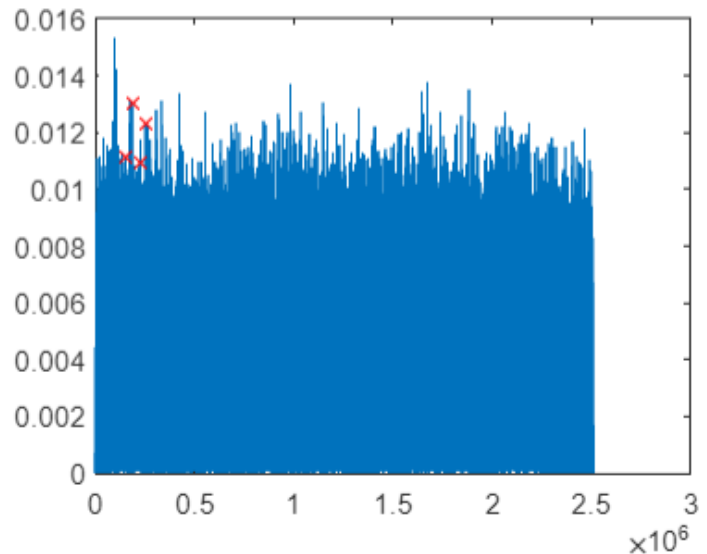
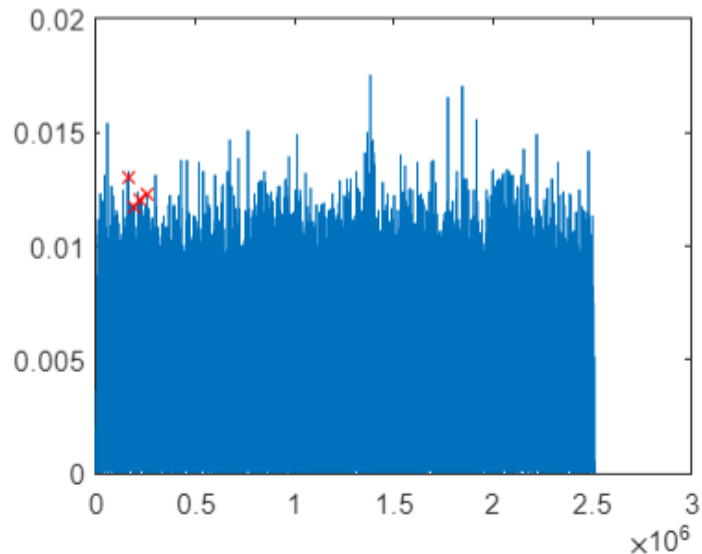
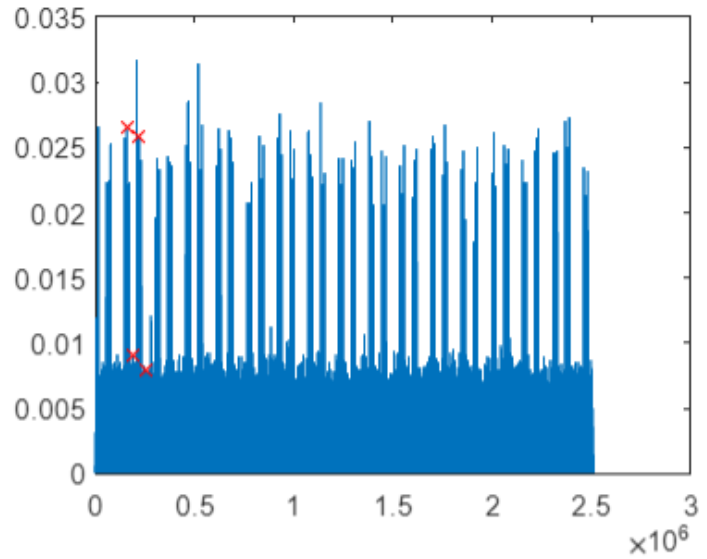
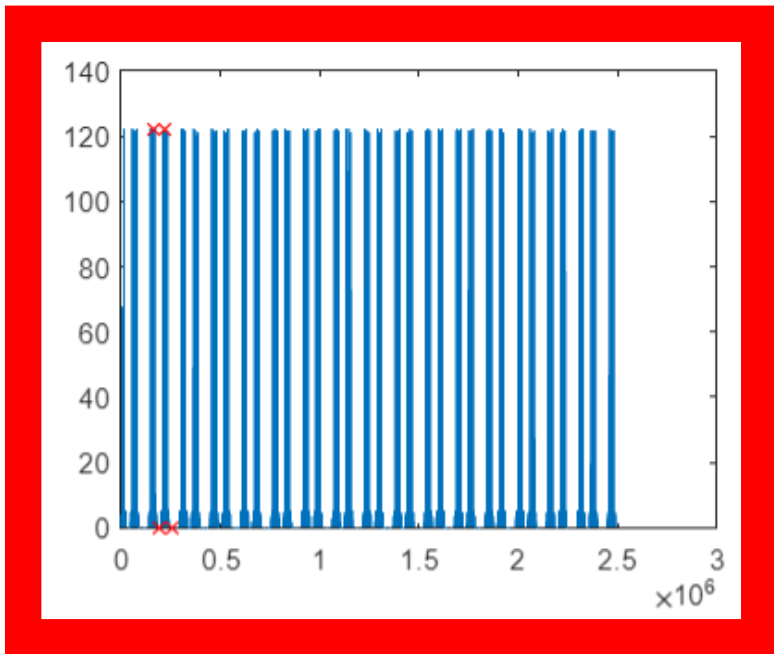


Channel 3



Channel 4

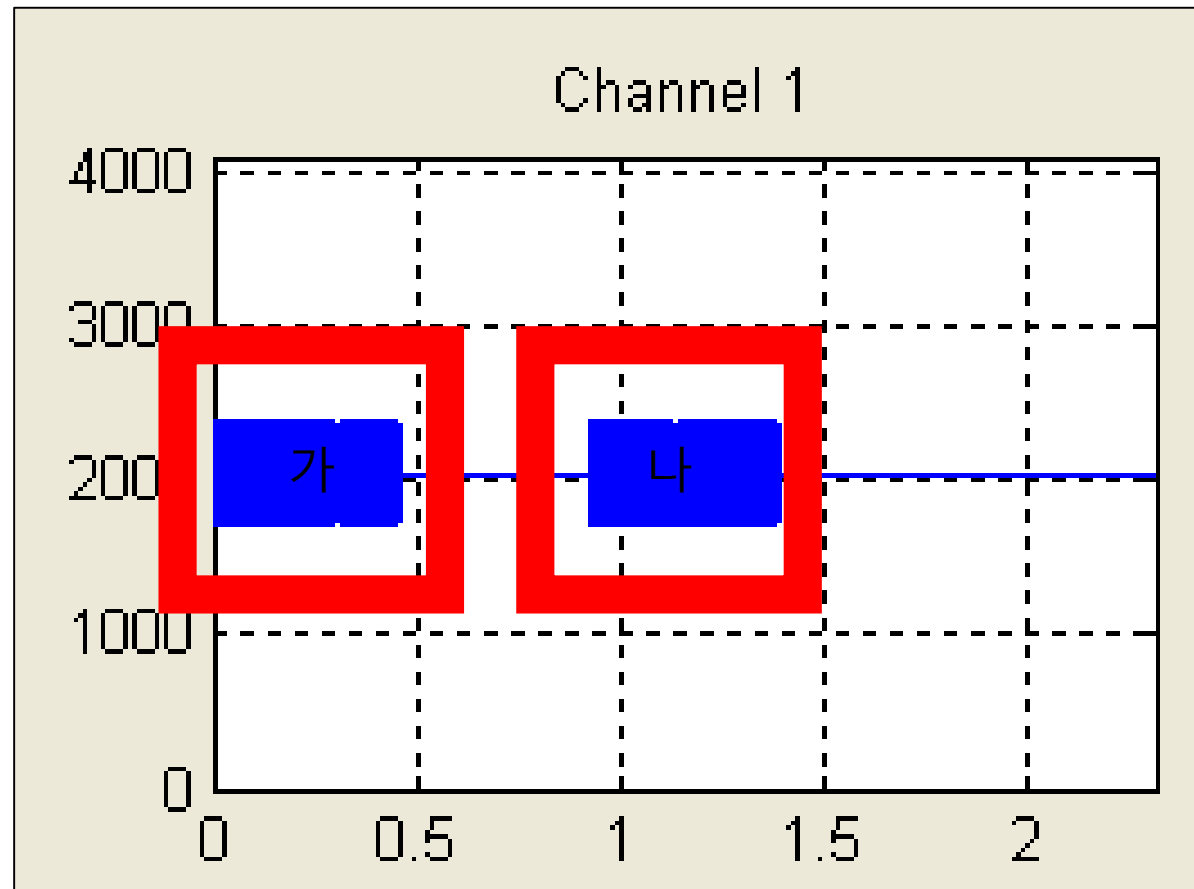
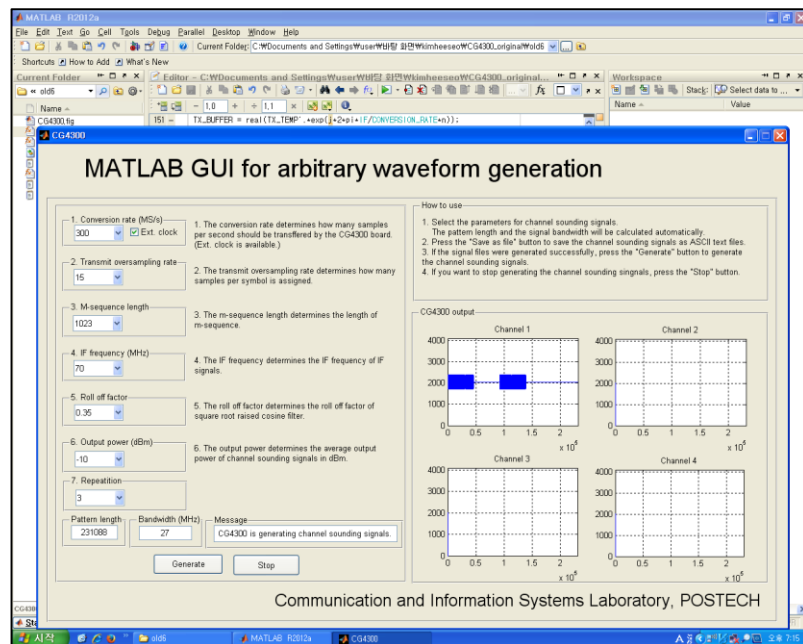




**correlator matlab 파일 실행**  
**- channel 1만 실행**  
**(compu scope, compugen channel**  
**1 : back-to-back 연결)**

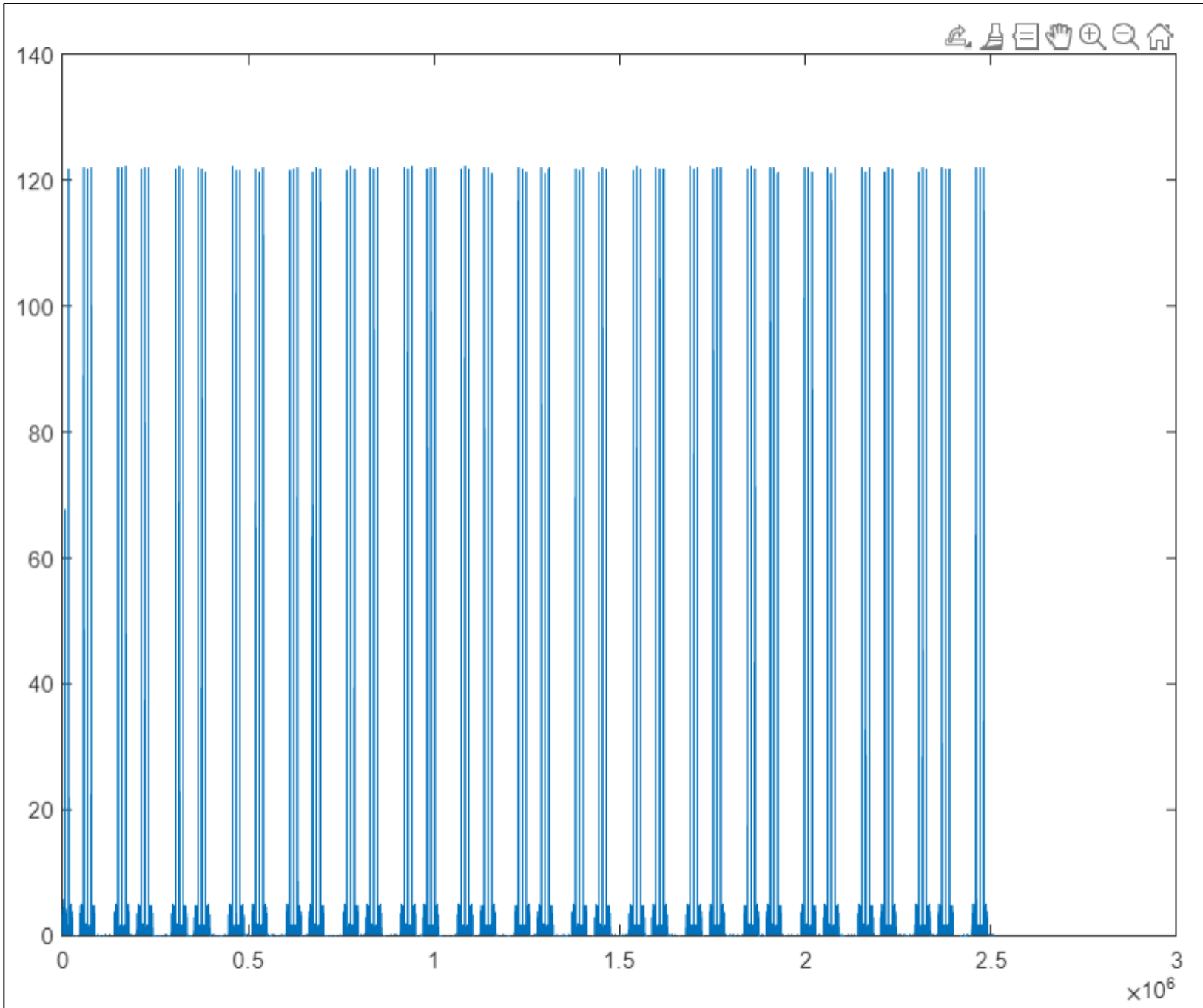
a	2510349	1x1	double
aa	1x1523 dou...	1x1523	double
C	1x96 double	1x96	double
corr1	4x2510349 ...	4x2510349	double (com...
corr3	1x2530809 ...	1x2530809	double (com...
DATA	4x2500000 ...	4x2500000	double
data	4x2500000 ...	4x2500000	double
DATA_b...	4x2500000 ...	4x2500000	double (com...
data_in	4x2500000 ...	4x2500000	double
data_type	1	1x1	double
delta	10230	1x1	double
endpoint	77563	1x1	double
endpoint1	67333	1x1	double

**data\_in = 4x2500000 double**  
**C=correlation peak값만 추출한 것**



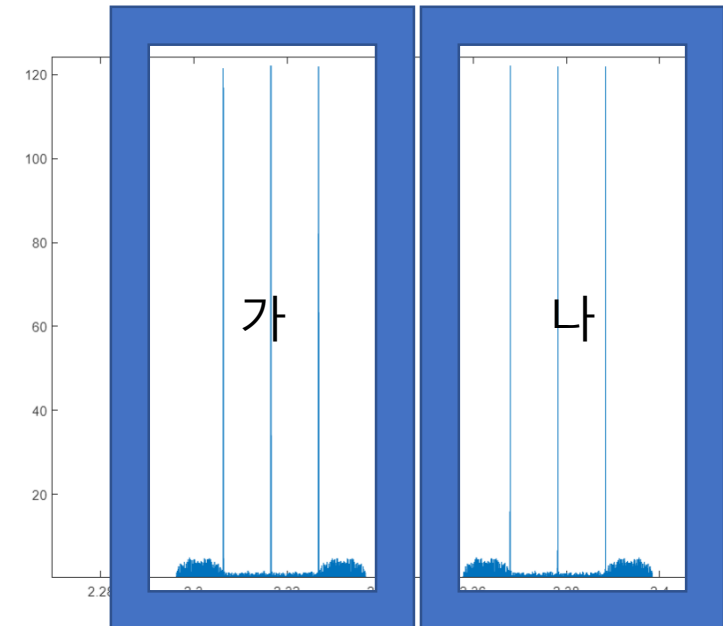
(가) Original 기준 channel 1값

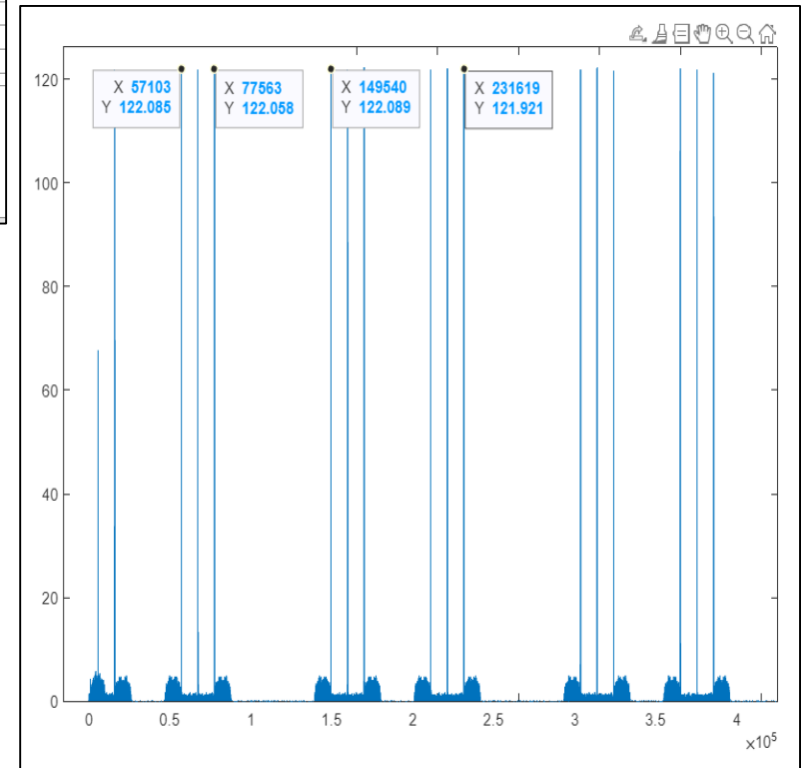
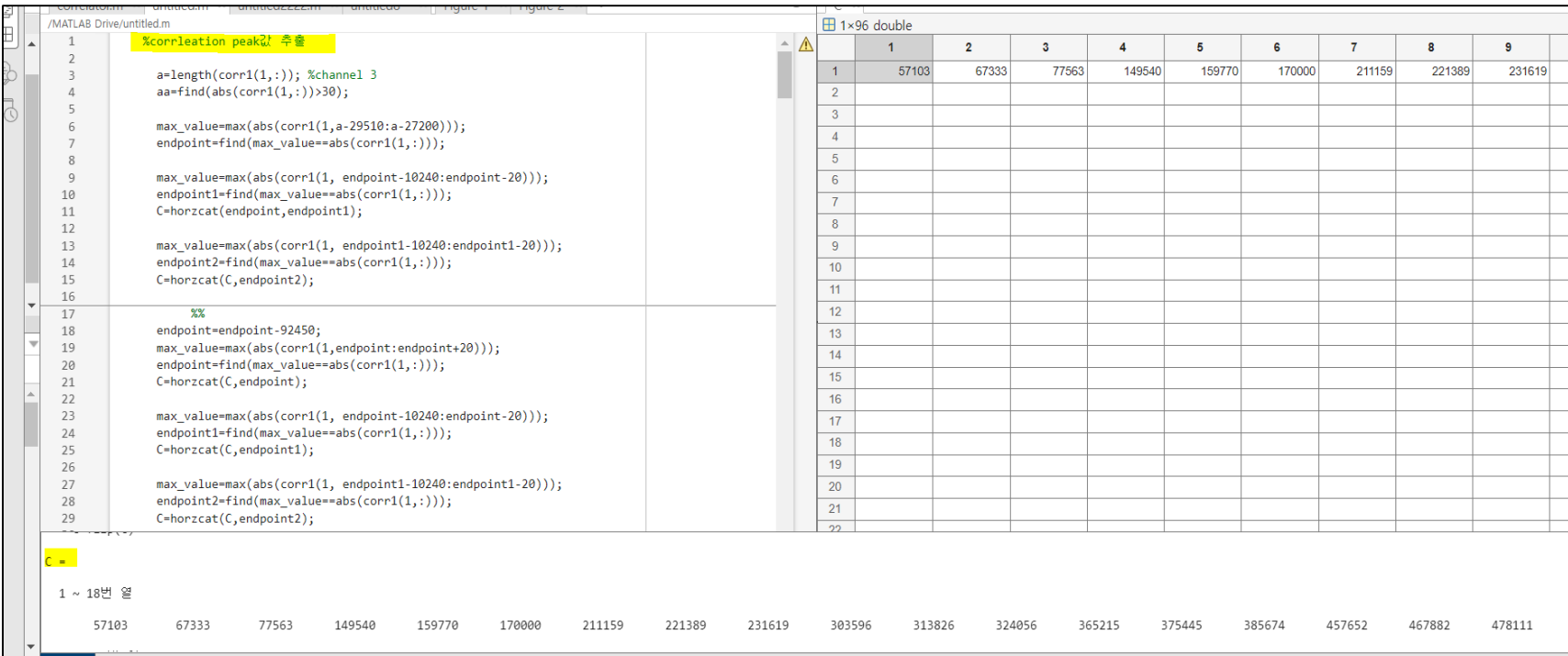
(나) channel 3값



`plot(abs(corr1(1,:)));`  
`hold on`; 확대한 값

(가) Original 기준 channel 1값  
(나) channel 3값





**Correlation peak 값 추출**  
- C에 저장되는 값은 correlation peak값의 위치를 나타내는 값

C =						
1 ~ 14번 열						
57103	67333	77563	149540	159770	170000	211159

corr1 x C x					
4x2510349 complex double					
		57102	57103	57104	
1	1.1057e+02i	-1.5644e+01 - 1.1787e+02i	-1.4967e+01 - 1.2116e+02i	-1.3823e+01 - 1.2022e+02i	
2	07 + 0.0037i	-0.0217 + 0.0040i	-0.0220 + 0.0041i	-0.0216 + 0.0040i	
3	77 + 0.0110i	-0.0078 + 0.0123i	-0.0078 + 0.0131i	-0.0078 + 0.0133i	
4	18 + 0.0041i	0.0019 + 0.0041i	0.0020 + 0.0038i	0.0019 + 0.0034i	
5					

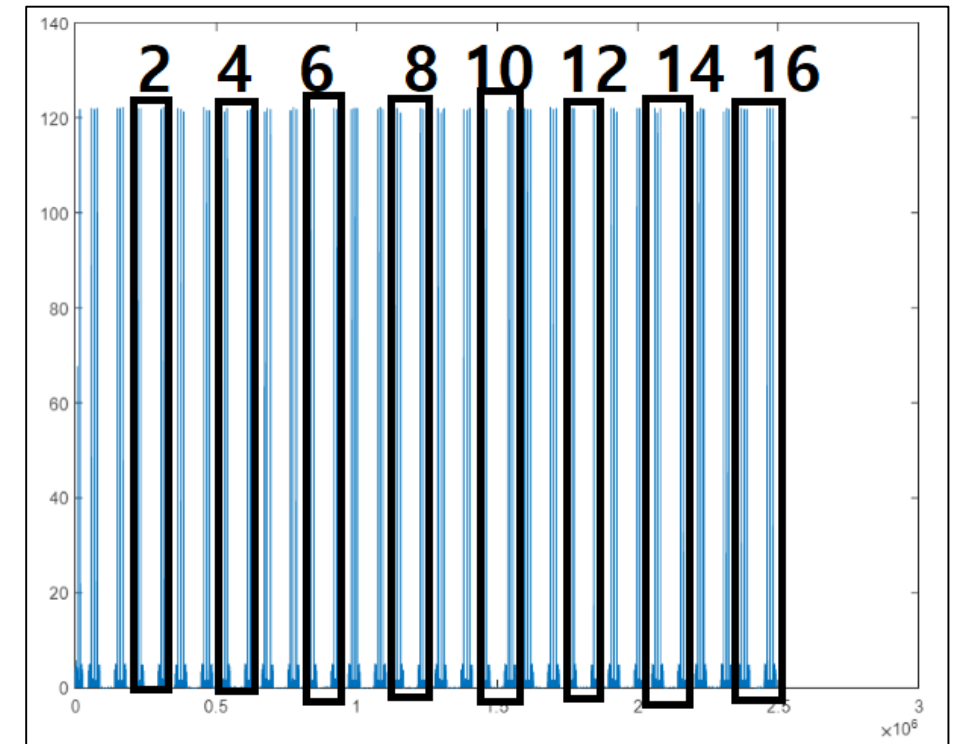
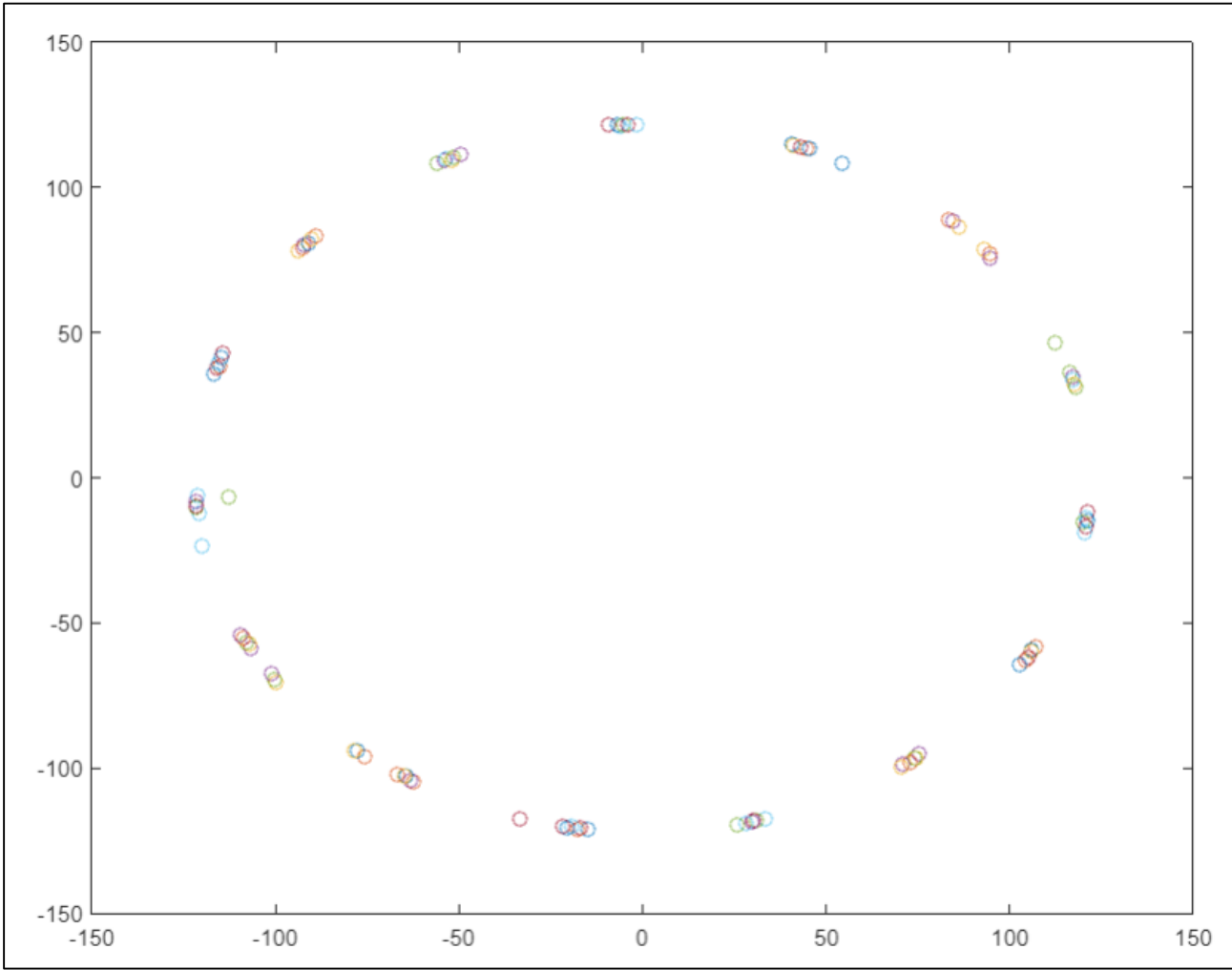
만일 **C**의 1번째 값이 '**57103**'의 경우,  
**Correlation**을 계산한 값이 저장된 **corr1**의 1행(channel 1) 57103열의 값인  
 '(-1.4967)\*e+01 -(1.2116)\*e+02'값이 **correlation peak**에 대응되는 복소수 값

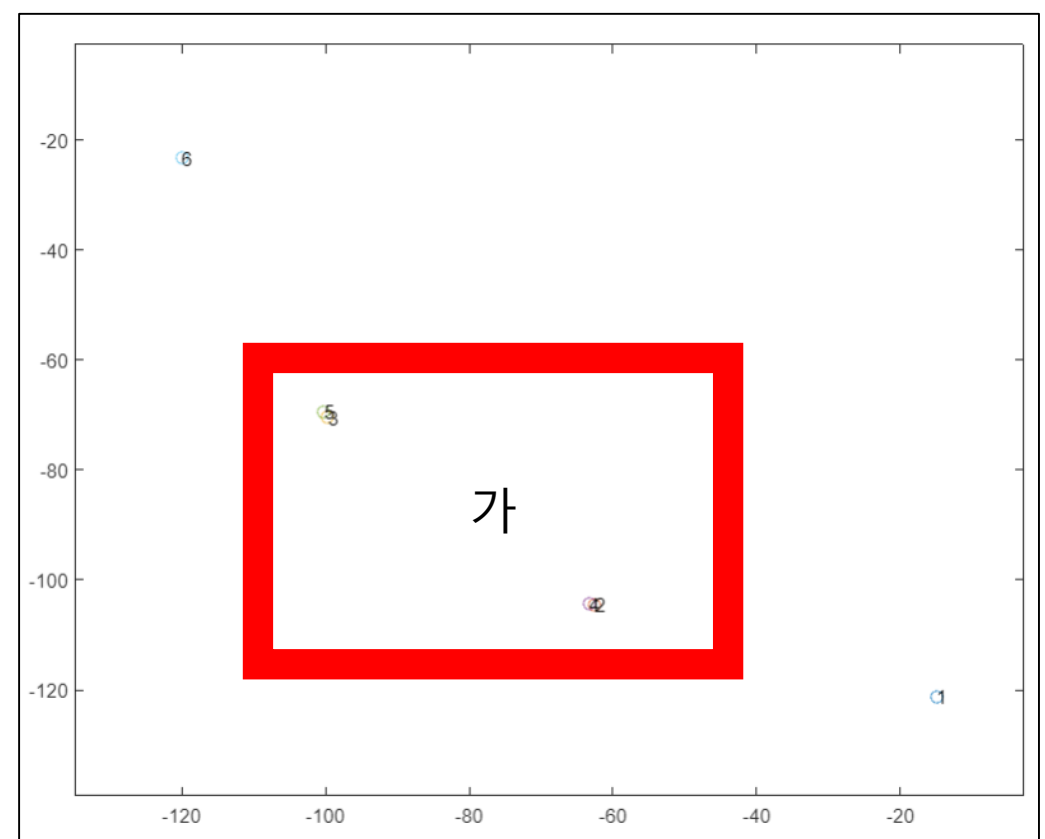
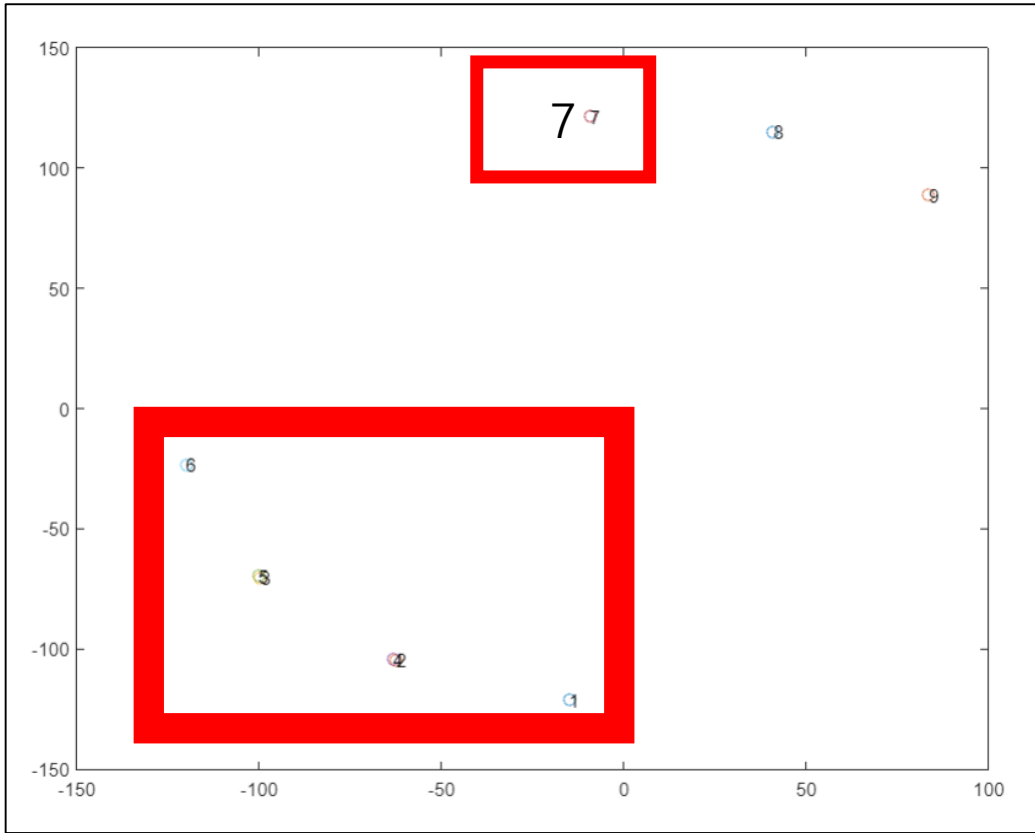


**Correlation peak**값을 추출한 뒤  
그 값에 해당하는 복소수 값 출력

원을 출력하는 것을 통해, **phase error** 존재 확인

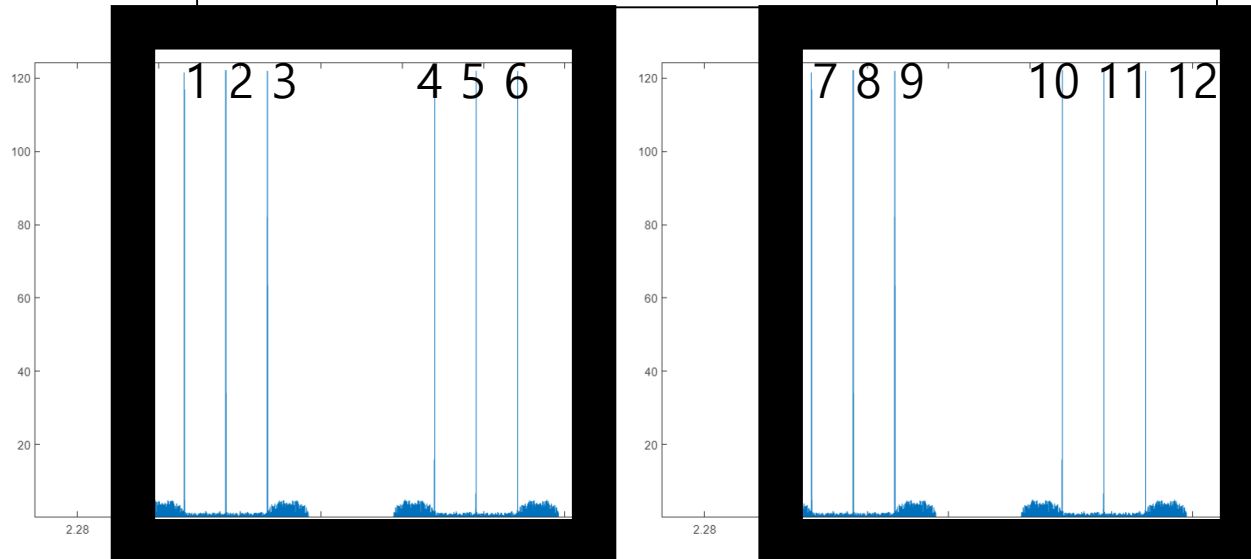
**C값 1\*96인 이유** : 16번 보내는 데, 1번 중 **origina**의  
**channel 1, 3**의 값이 합쳐져서 보내도록 설정하였고,  
각 채널마다 3개의 **peak point**가 출력되기에,  
 **$3(\text{peak point}) * 2(\text{original channel 1, 3의 값}) * 16 = 96$**



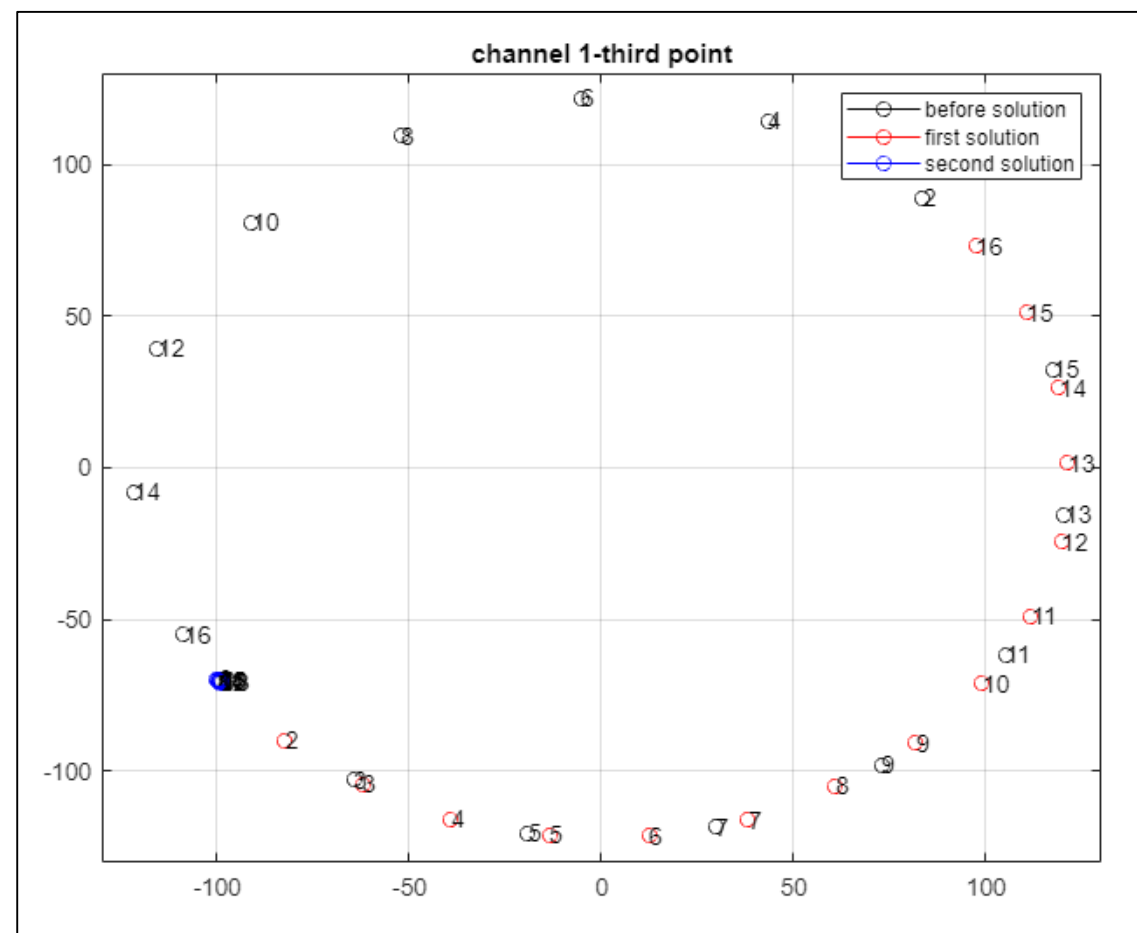
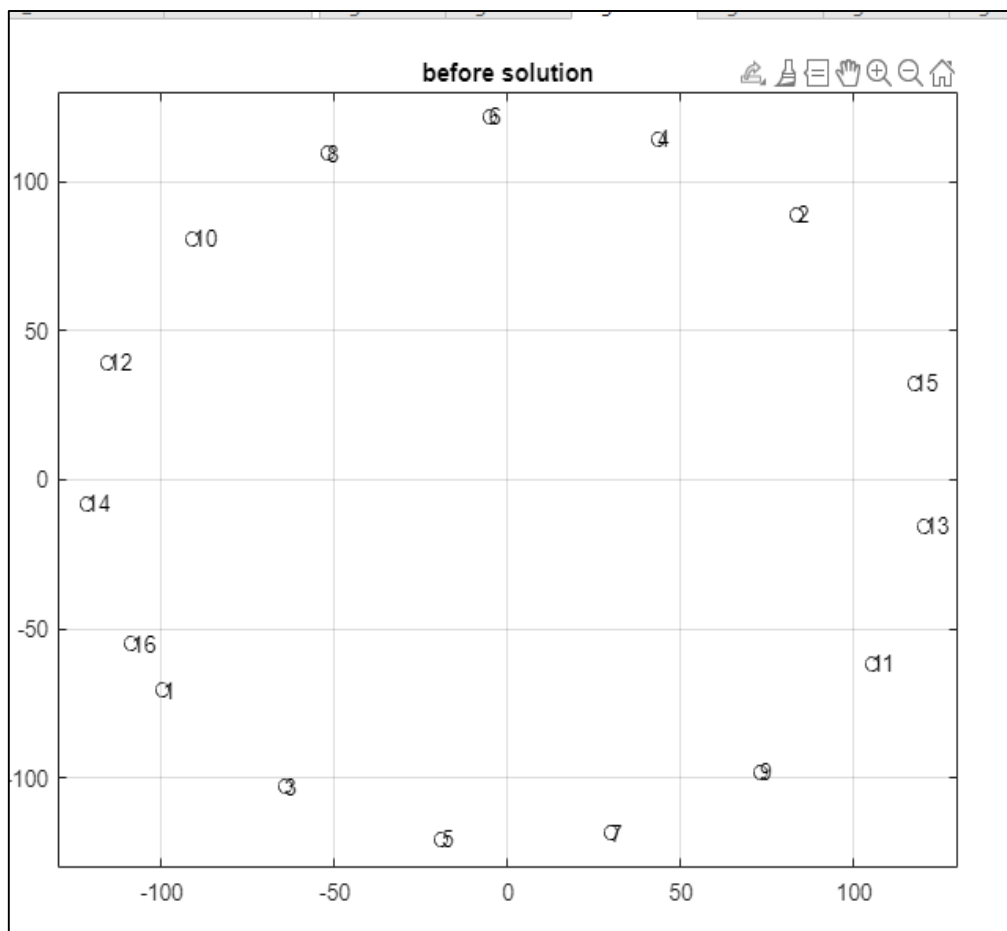
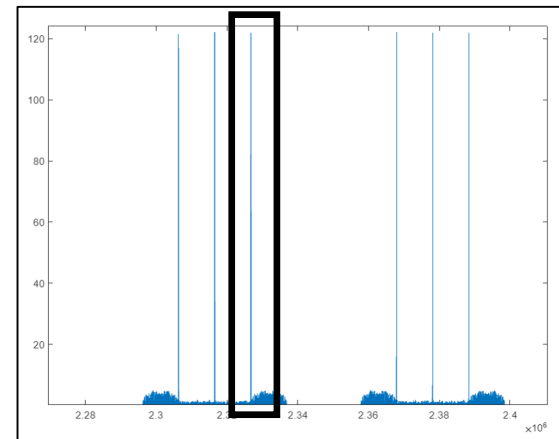


96개의 peak point를 순서대로 출력

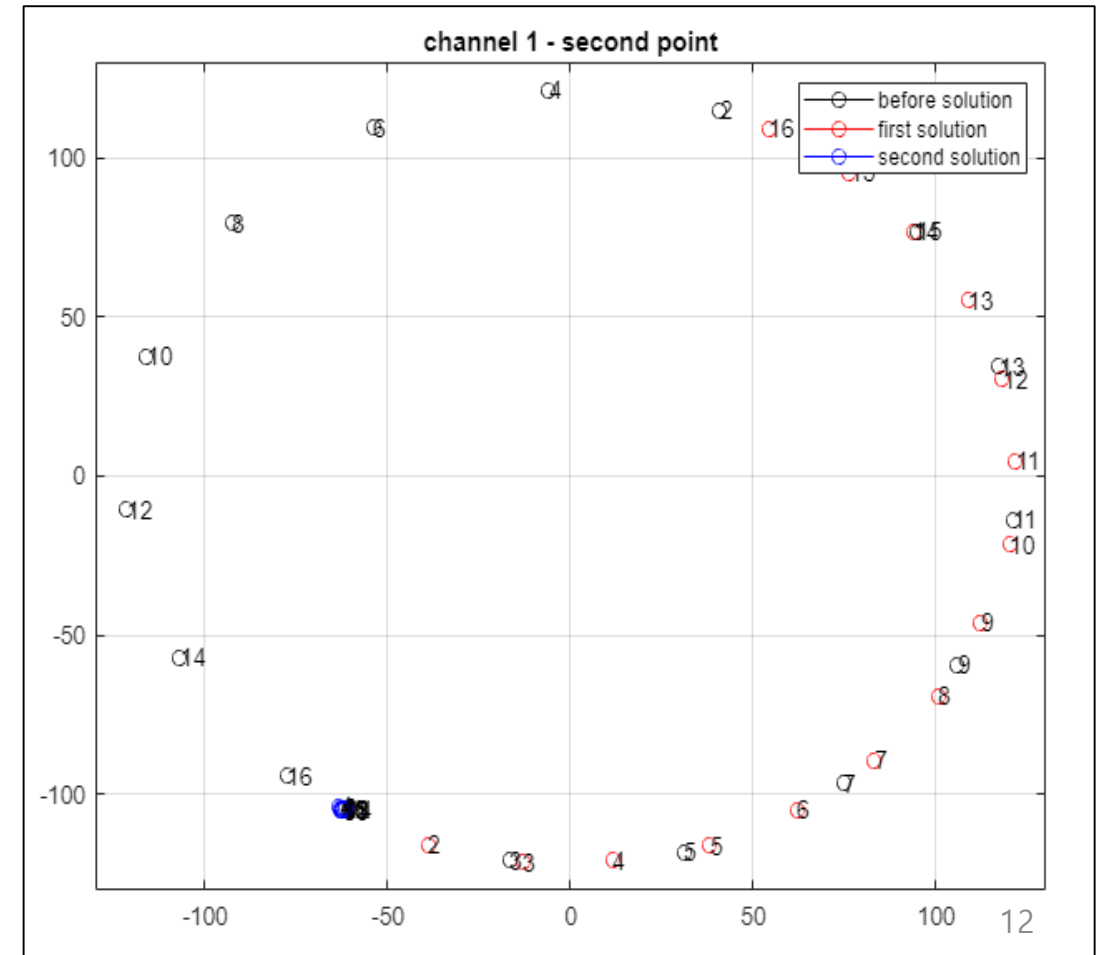
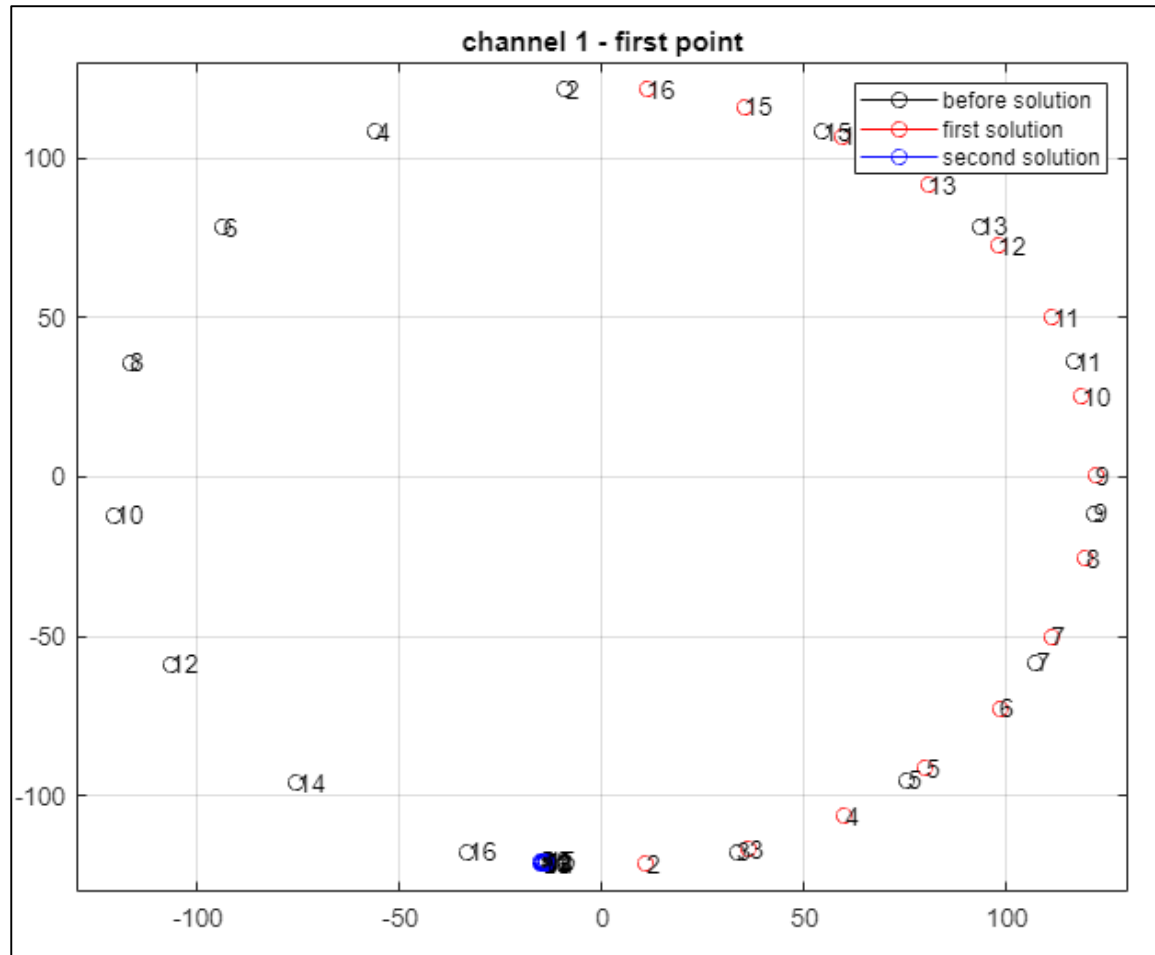
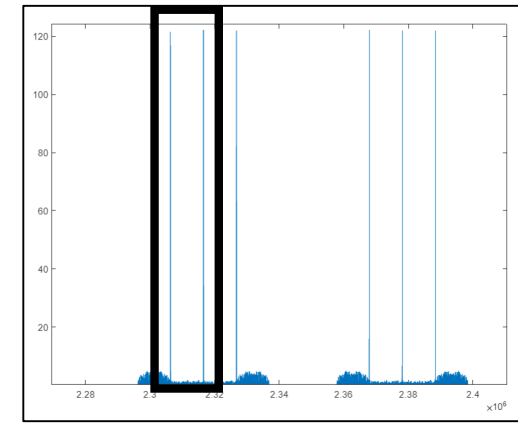
- "가"에 해당하는 부분 2, 4/3,5번째가 겹치는 것 확인
- Phase error 존재 확인
- 앞 page에서 channel 1,3을 하나의 block으로 했을 때, 1번째 블록의 1번째 peak point(1)과 2번째 블록의 1번째 peak point(7)이 대략 180정도 phase error

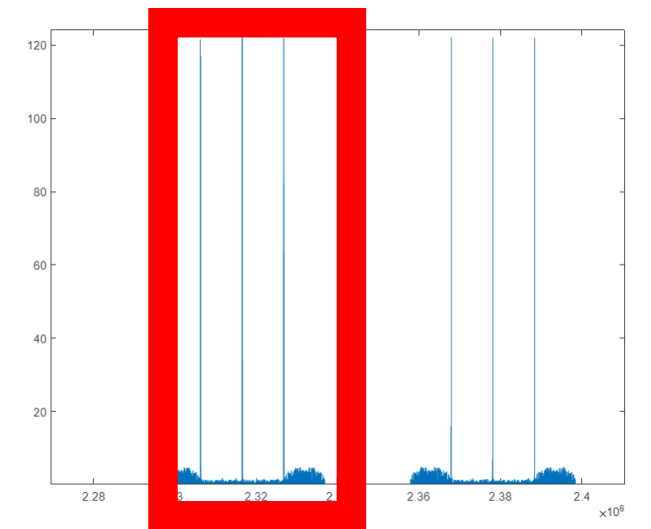
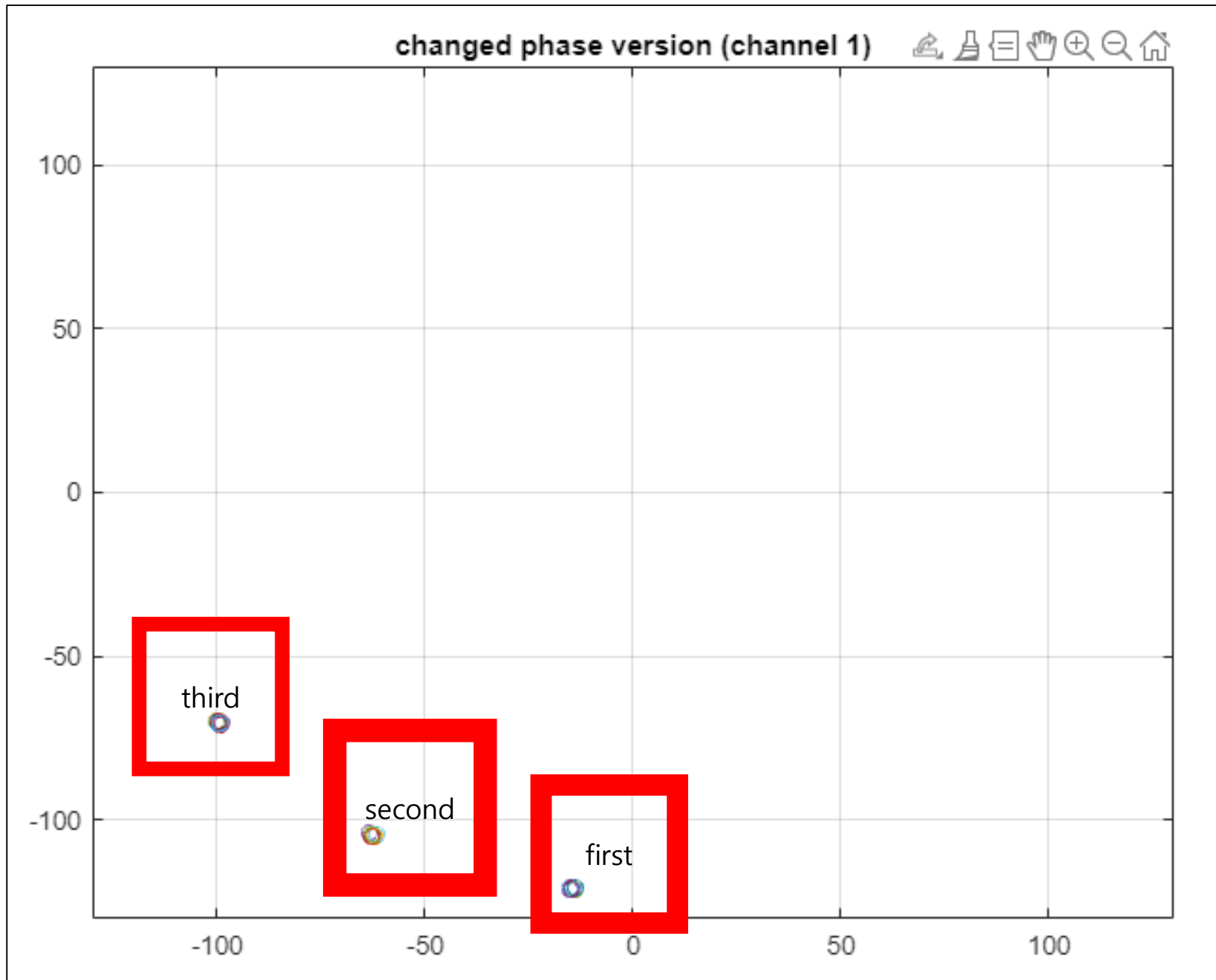


# Channel 1 – third point

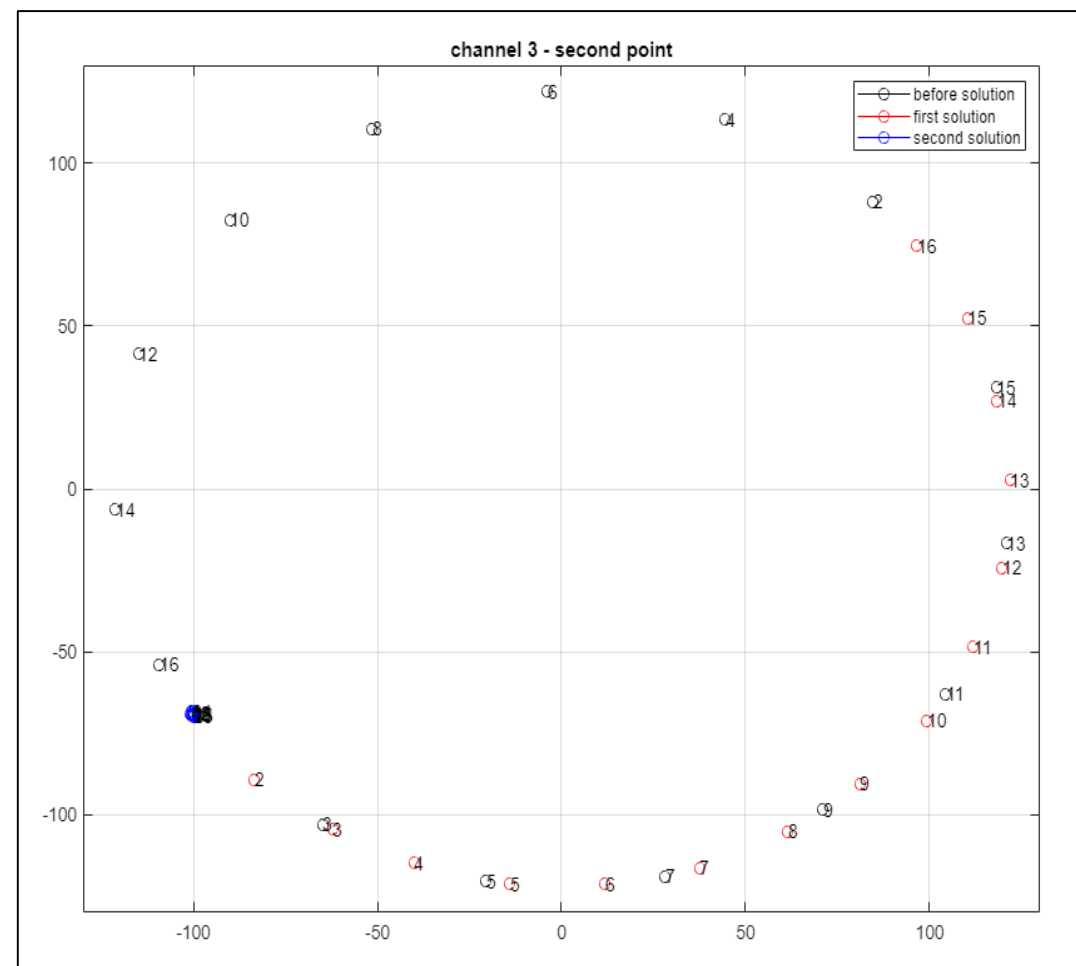
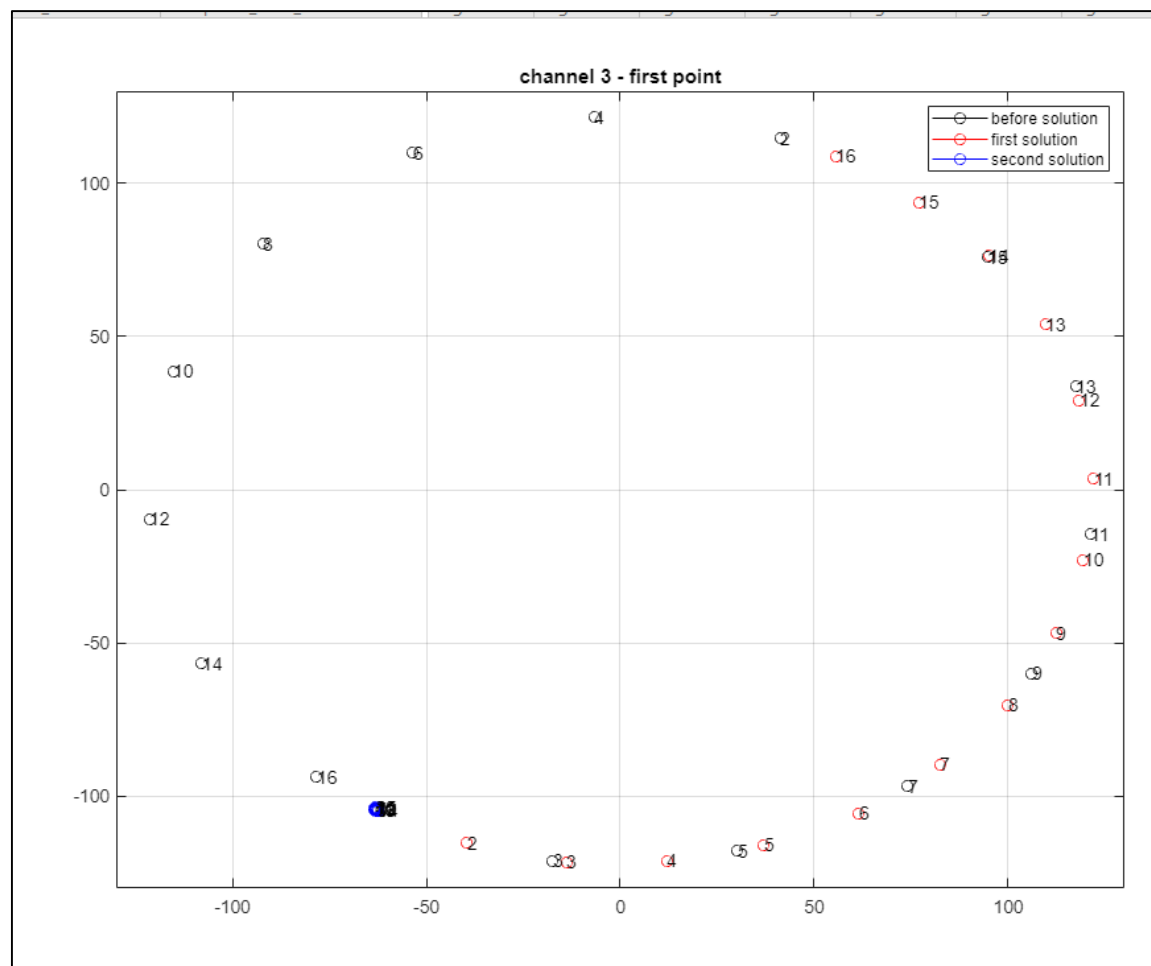
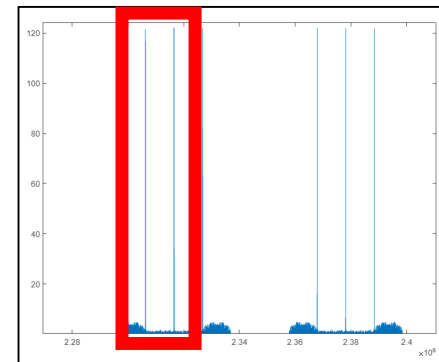


# Channel 1 – first, second point

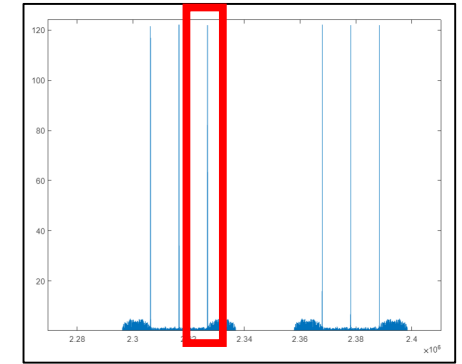
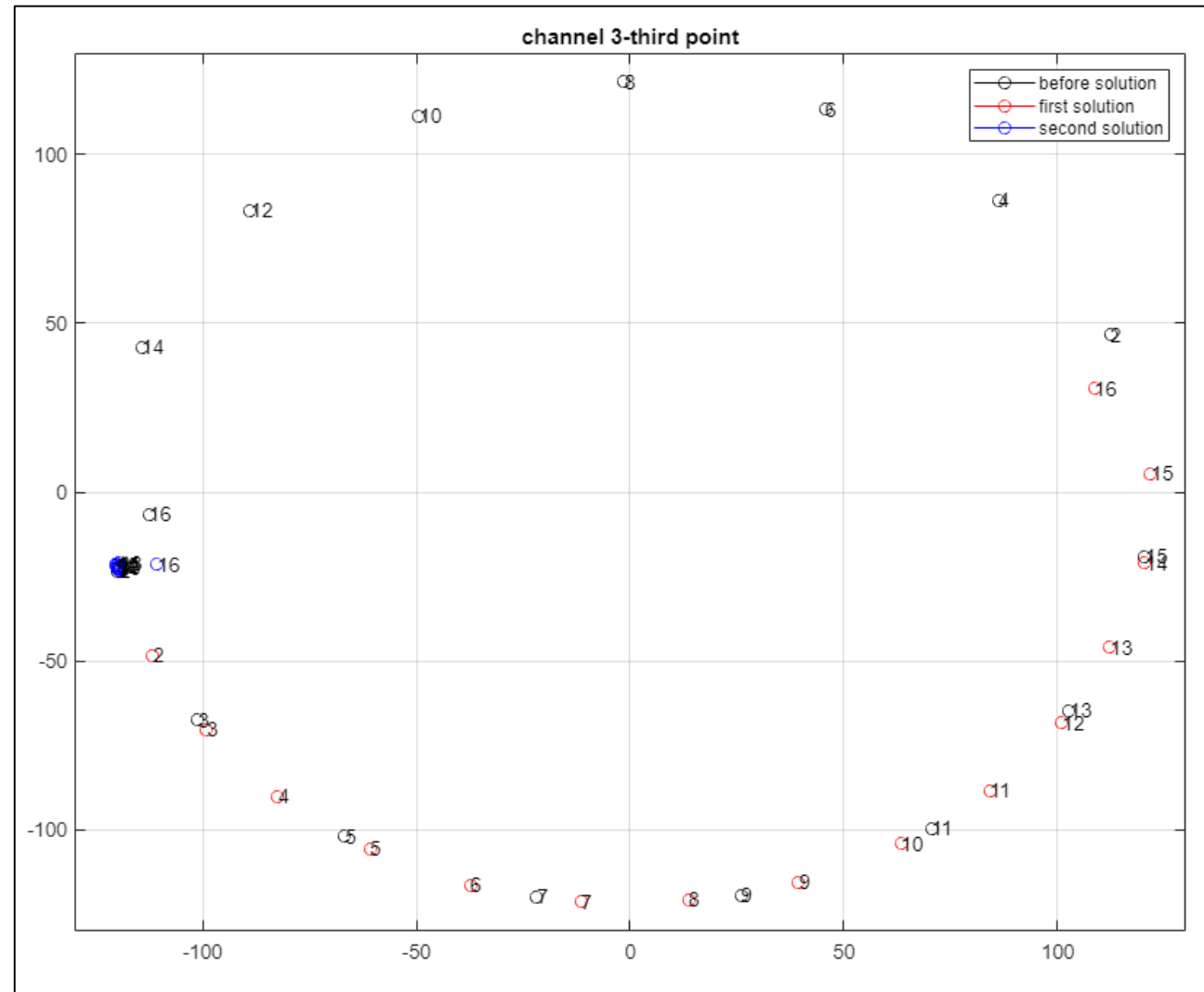




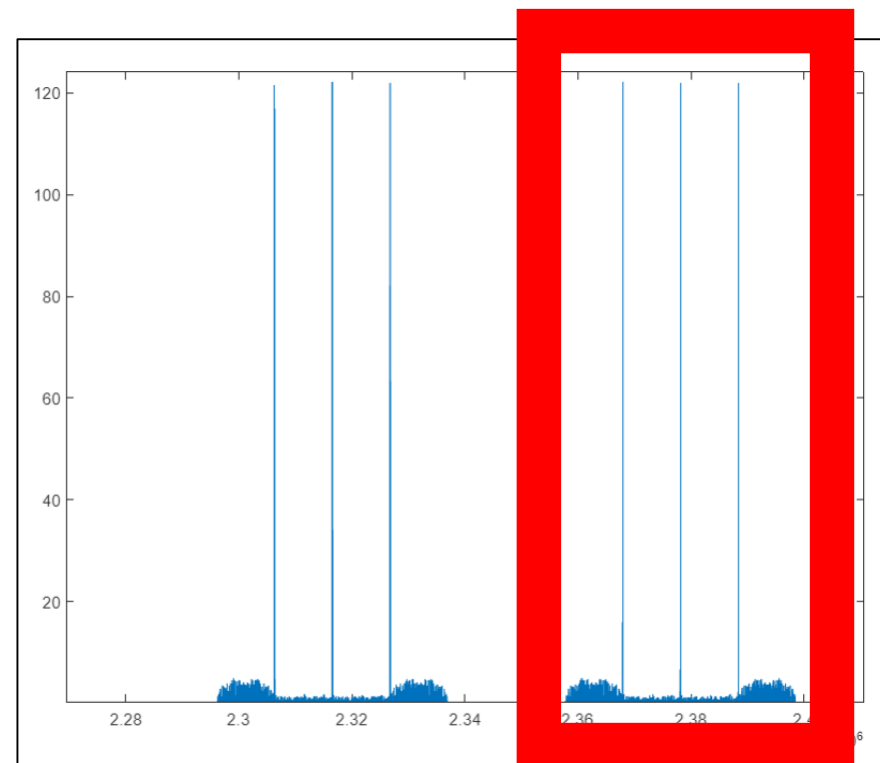
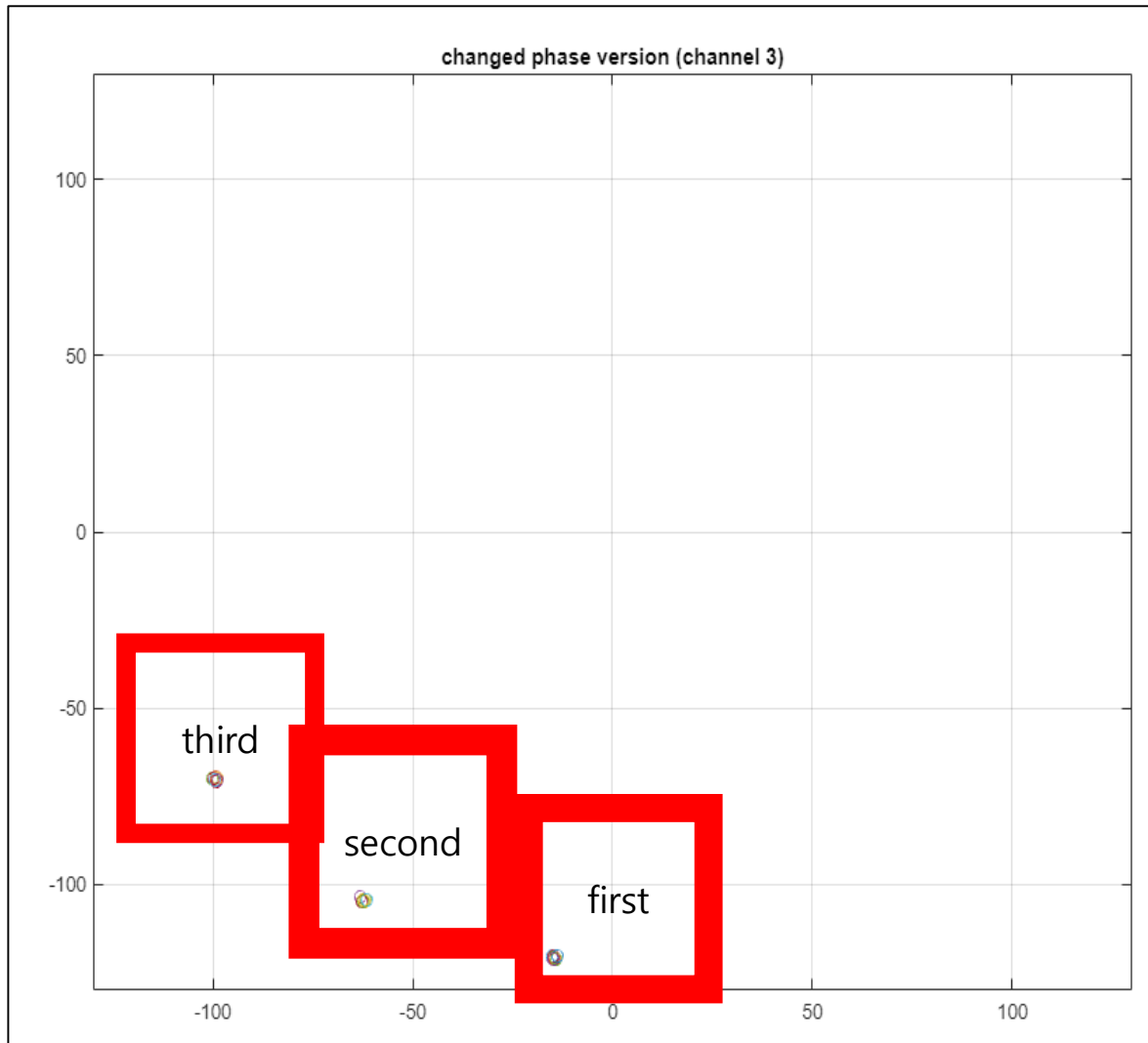
# Channel 3



# Channel 3



# Channel 3





# Total value : channel 1, 3 보정 후의 값

