

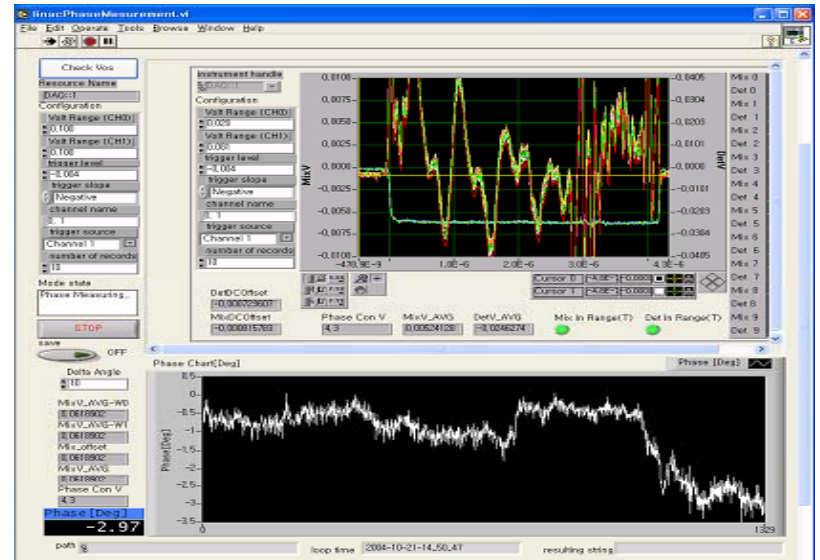
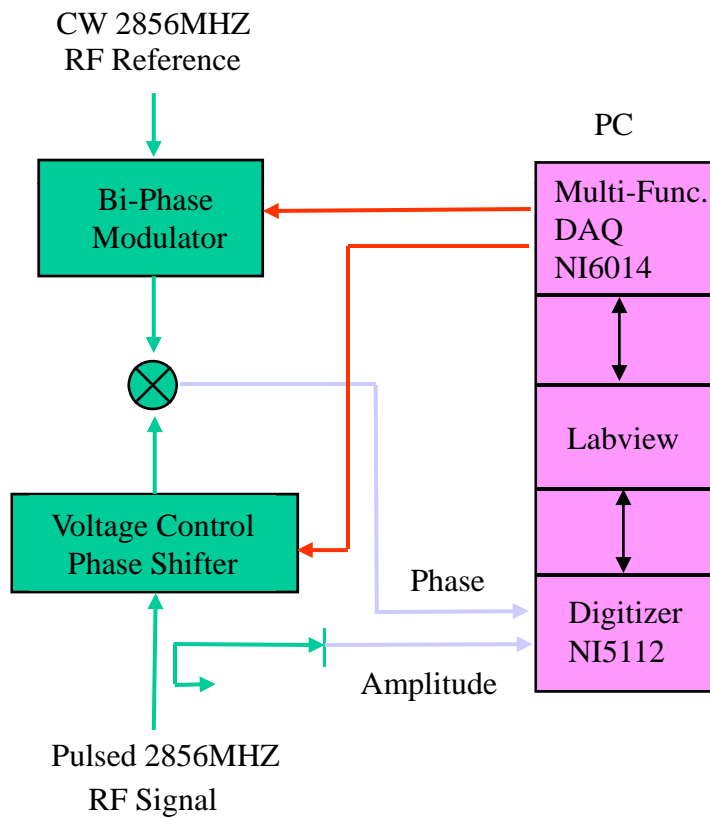
# **Phase And Amplitude Measurement System**

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PAL/POSTECH

KNU/KEK Workshop in KNU

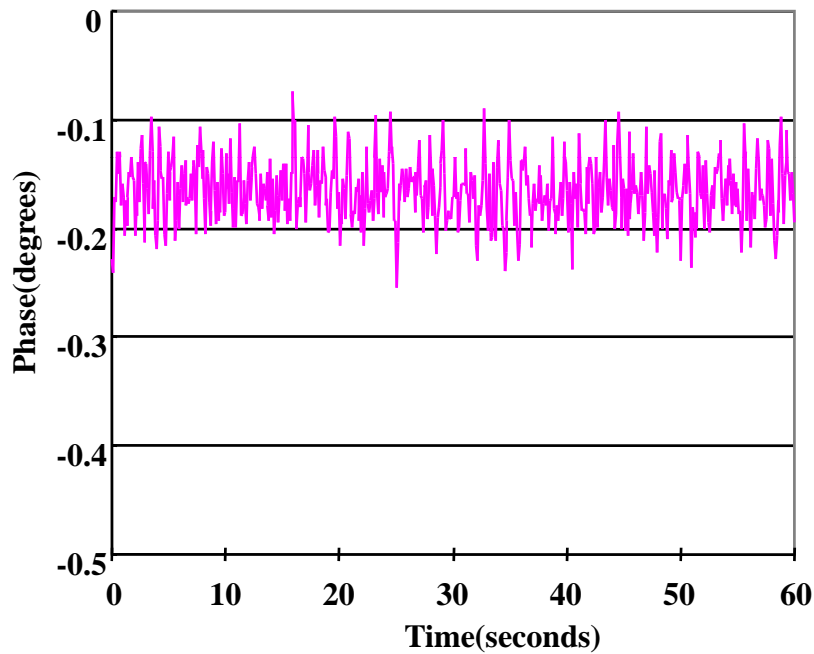
2008, 03, 17

# Phase Measurement System

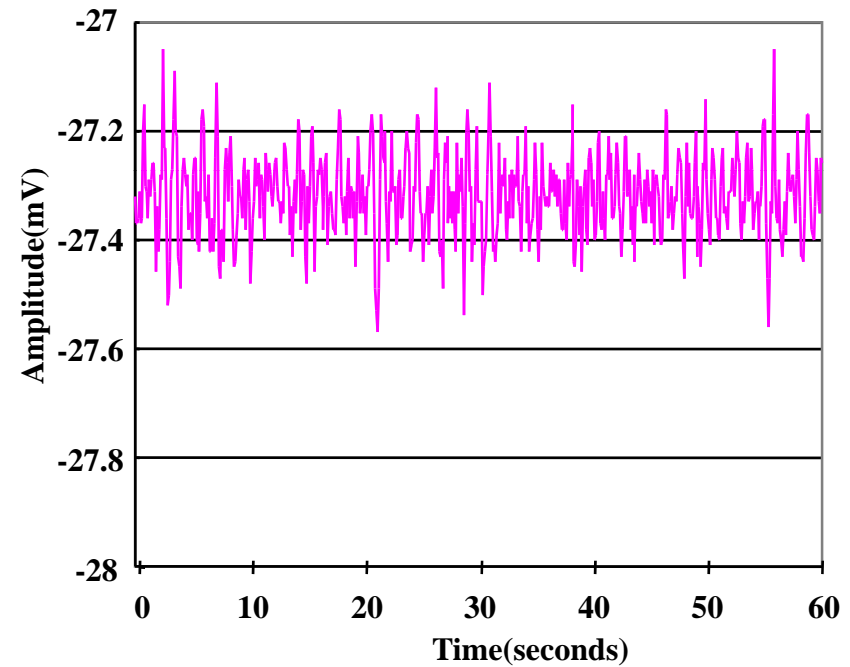


# RF Phase and Amplitude Measurement

Test Lab (10Hz, during 1minute)



Phase variation ; 0.1 degrees (peak-peak)  
0.03 degrees (rms)



Amplitude variation; 1.85 % (Peak-Peak)  
0.3 % (rms)

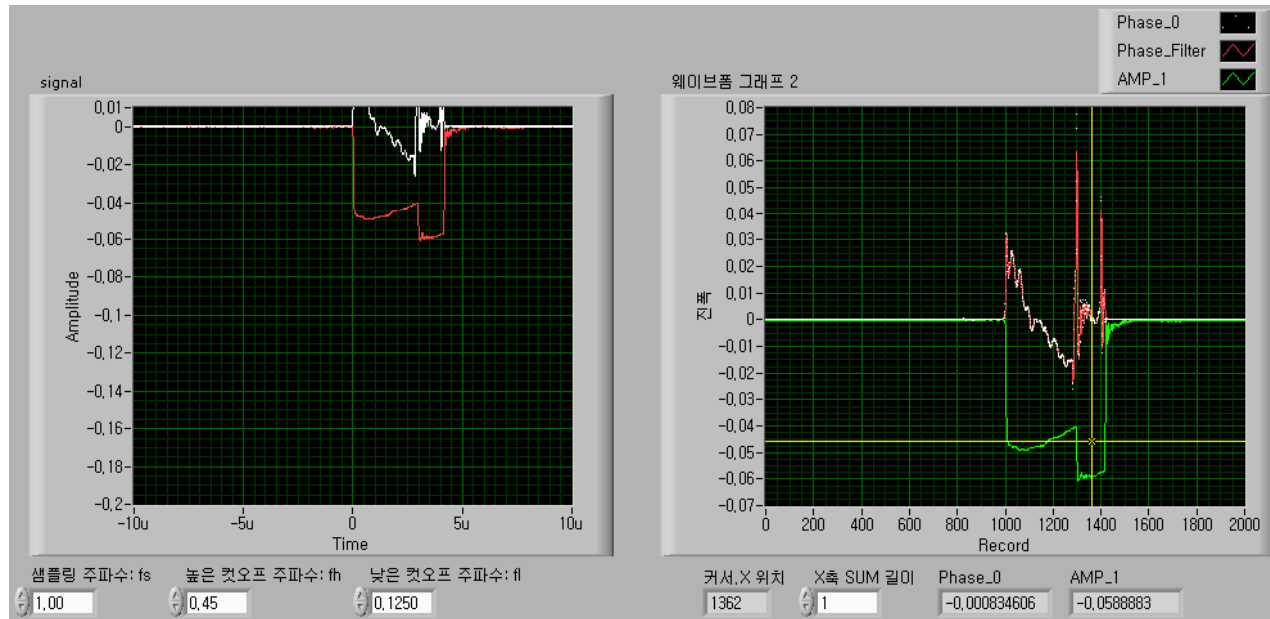
# Phase And Amplitude Measurement System

(K4 Klystron Output Stability Measurement)

2007, 10, 12



# K4 Klystron Output Stability Measurement 2007, 10,12 AM11





# Deqing\_Off

0.51 degrees/2.03%



# Deqing\_ON Feedforward\_off

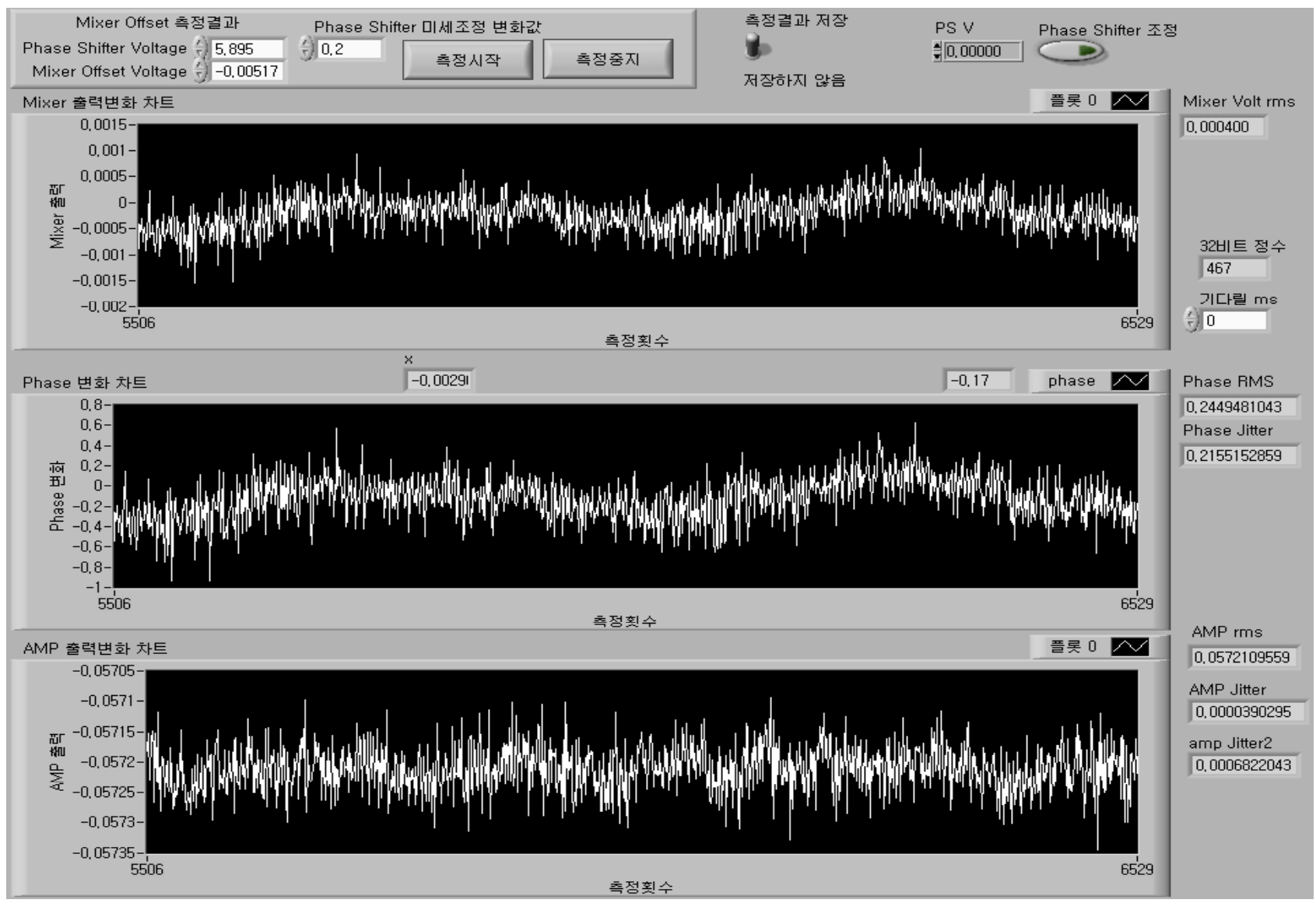
0.34 degrees/0.073%



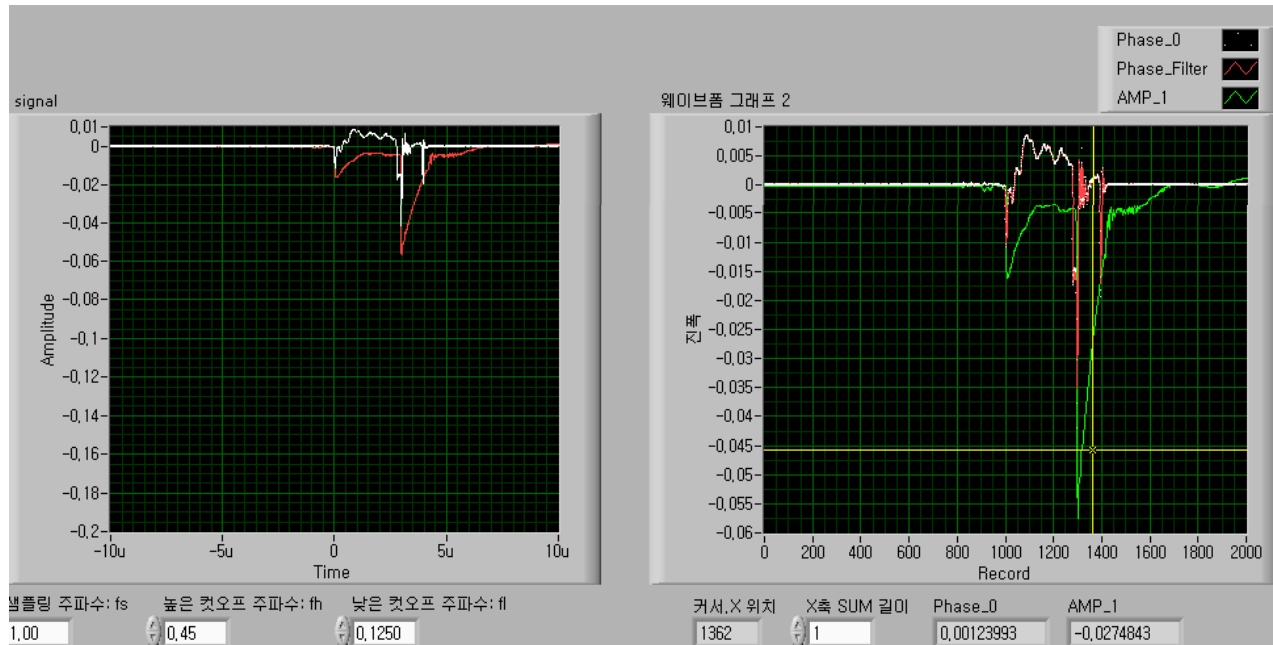


# Deqing\_ON Feedforward\_on

0.22 degrees/0.068%

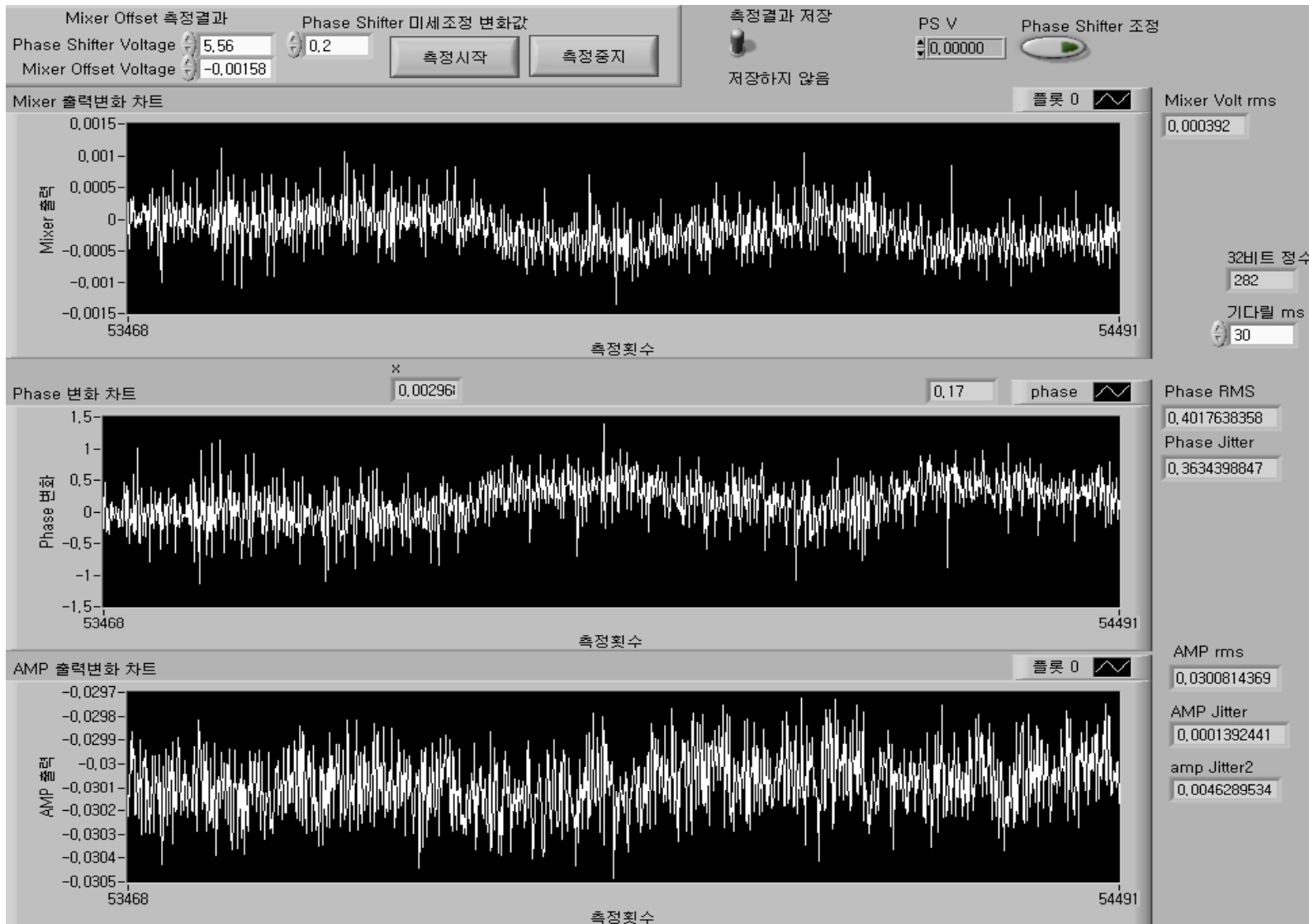


# K4 SLED Output Stability Measurement (After PSK) 2007, 10,12 PM 3



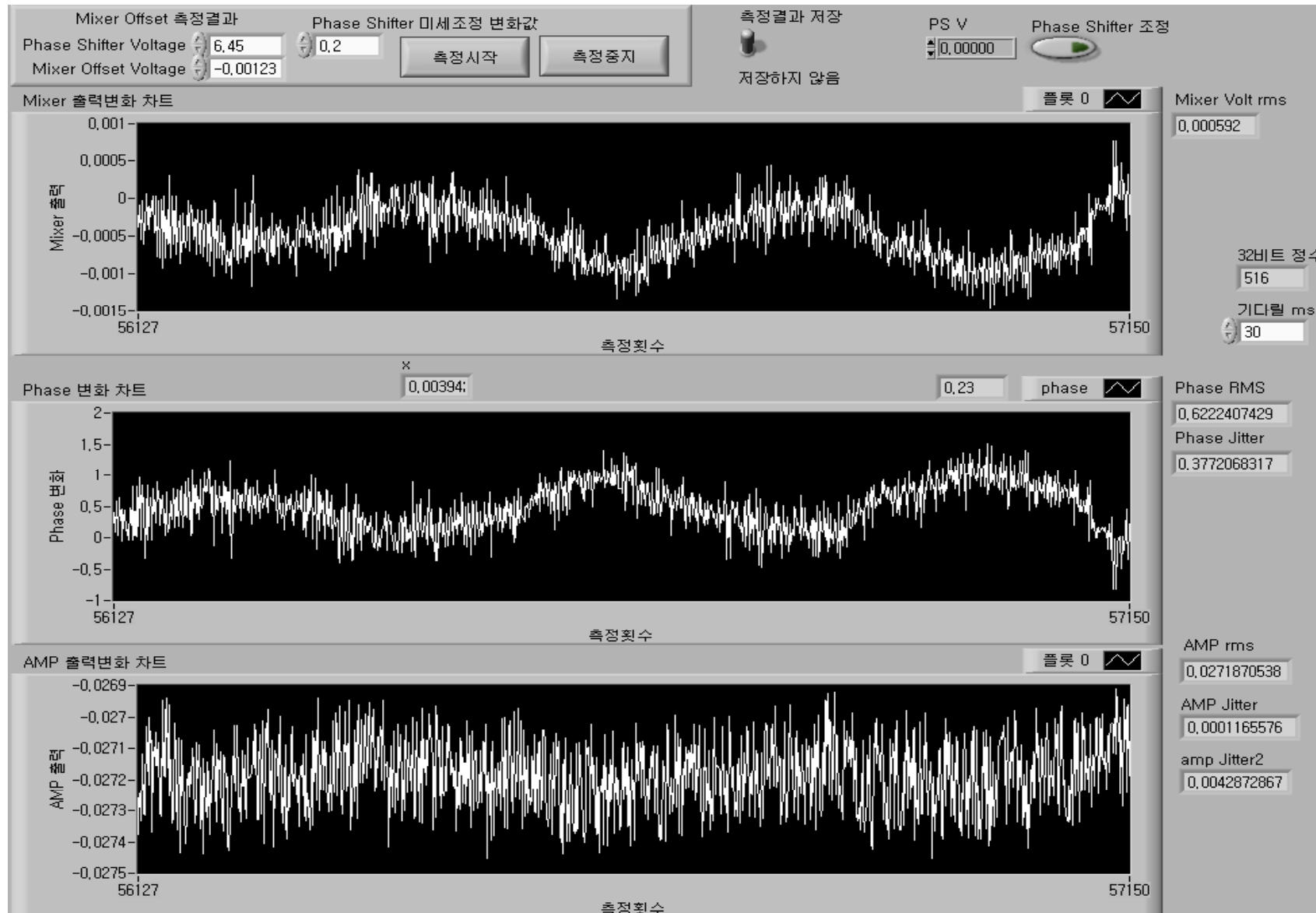
# Deqing\_Off

0.36 degrees/0.46%



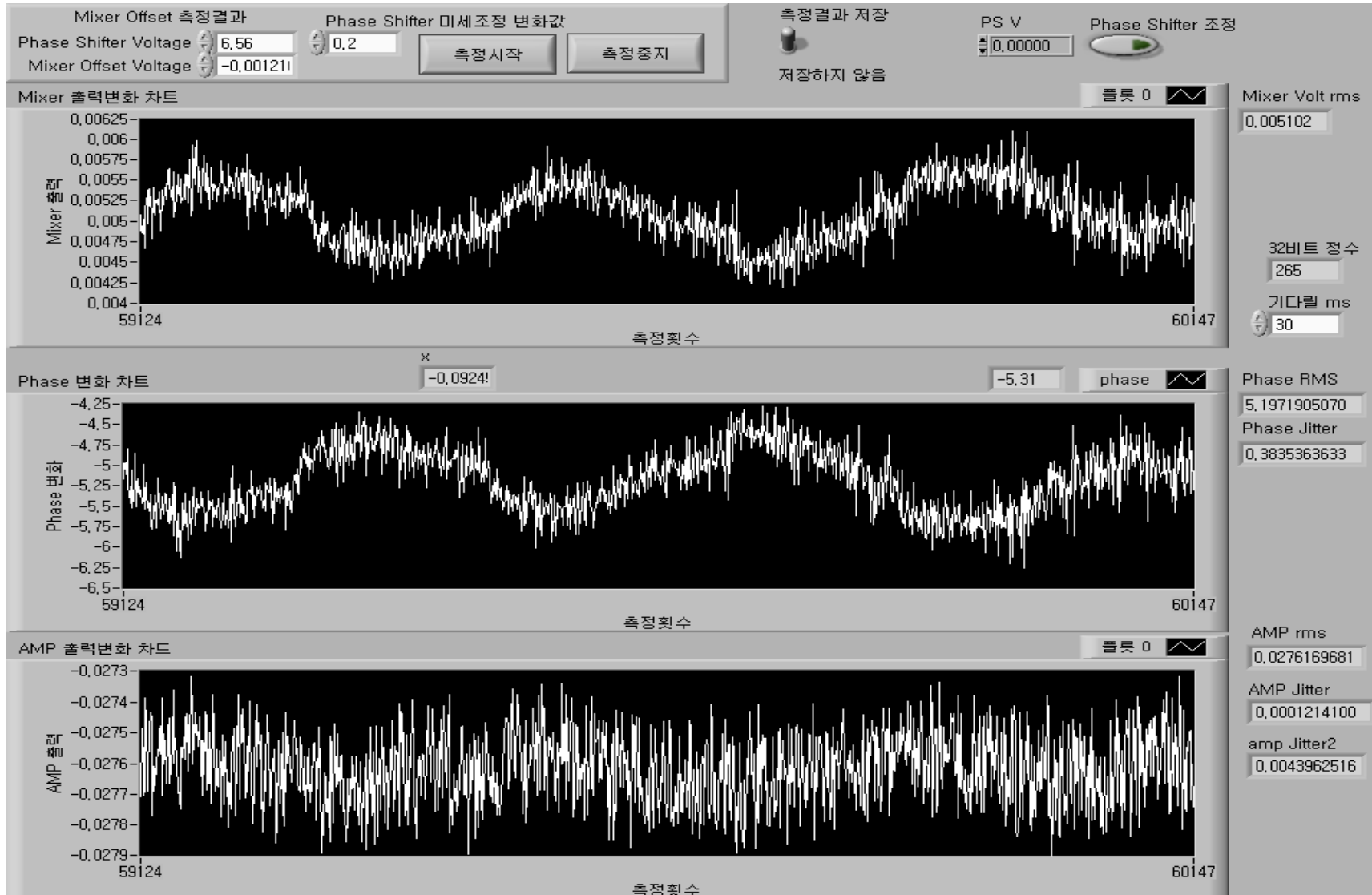
# Deqing\_ON Feedforward\_off

0.38 degrees/0.43%

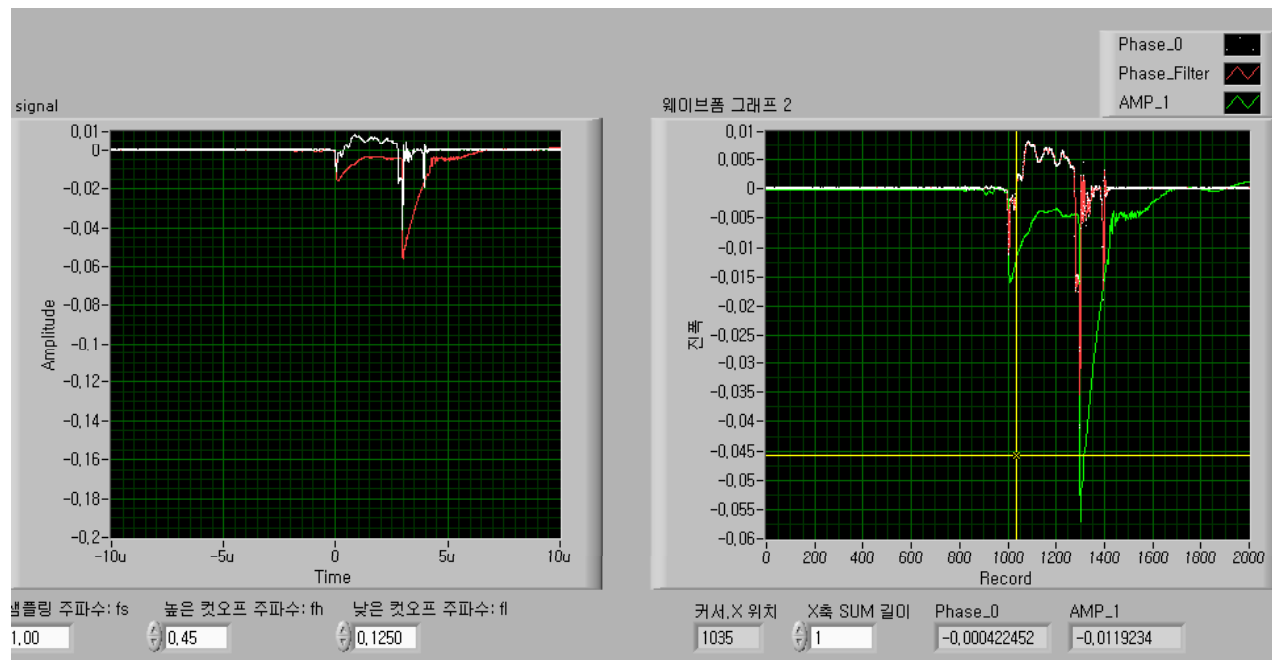


# Deqing\_ON Feedforward\_on

0.38 degrees/0.44%

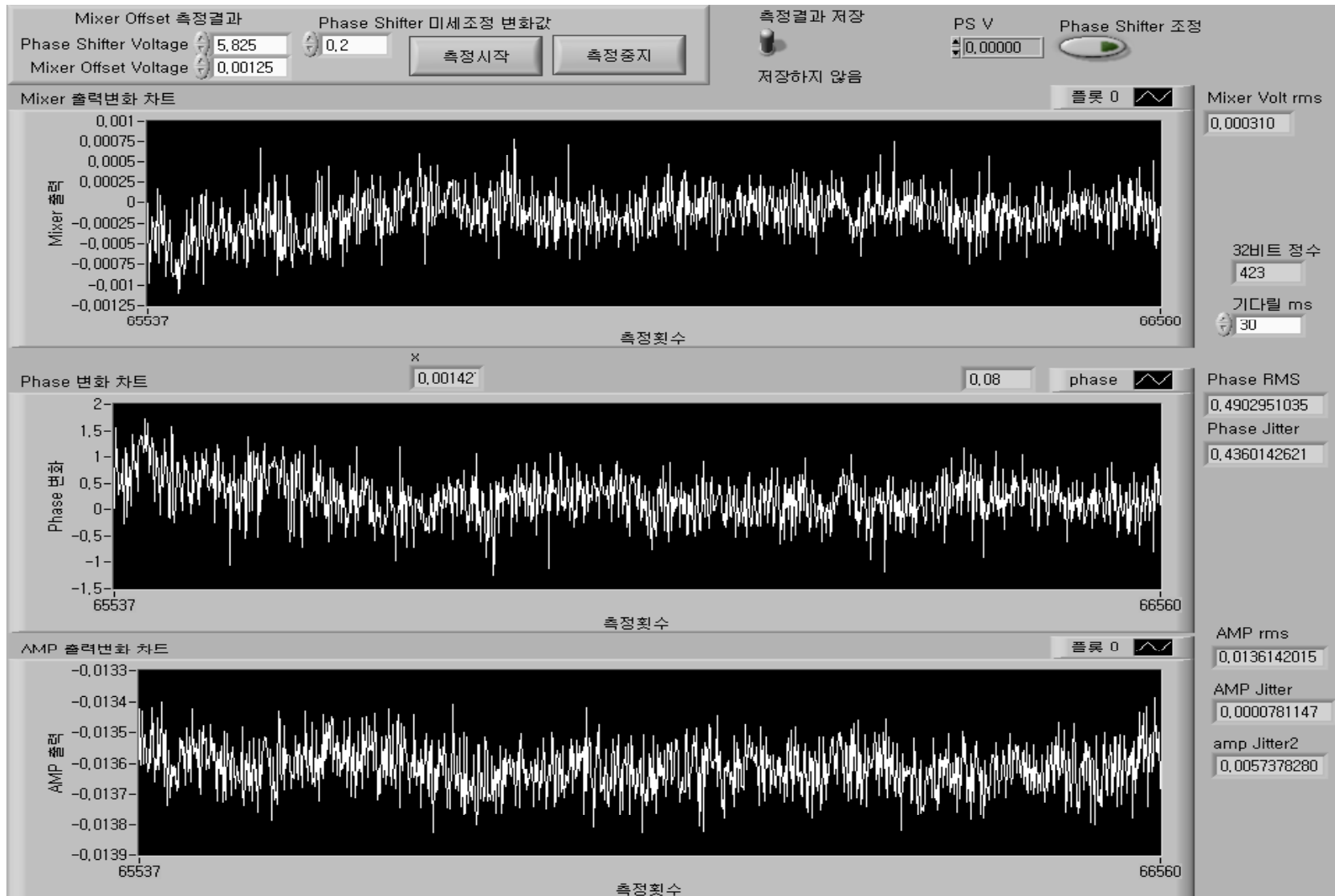


# K4 SLED Output Stability Measurement (before psk) 2007, 10,12 PM 5



# Deqing\_Off

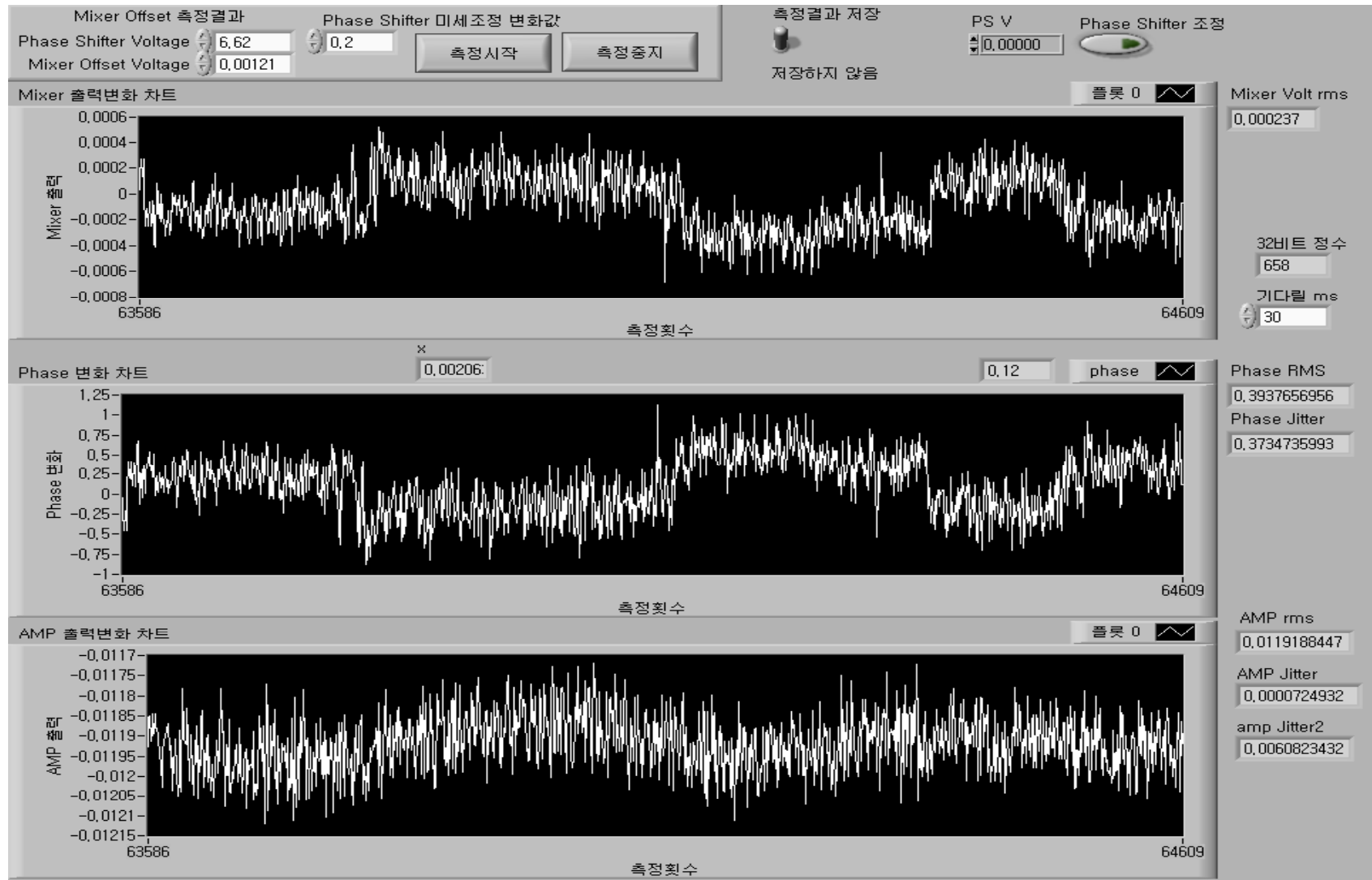
0.46 degrees/0.57%





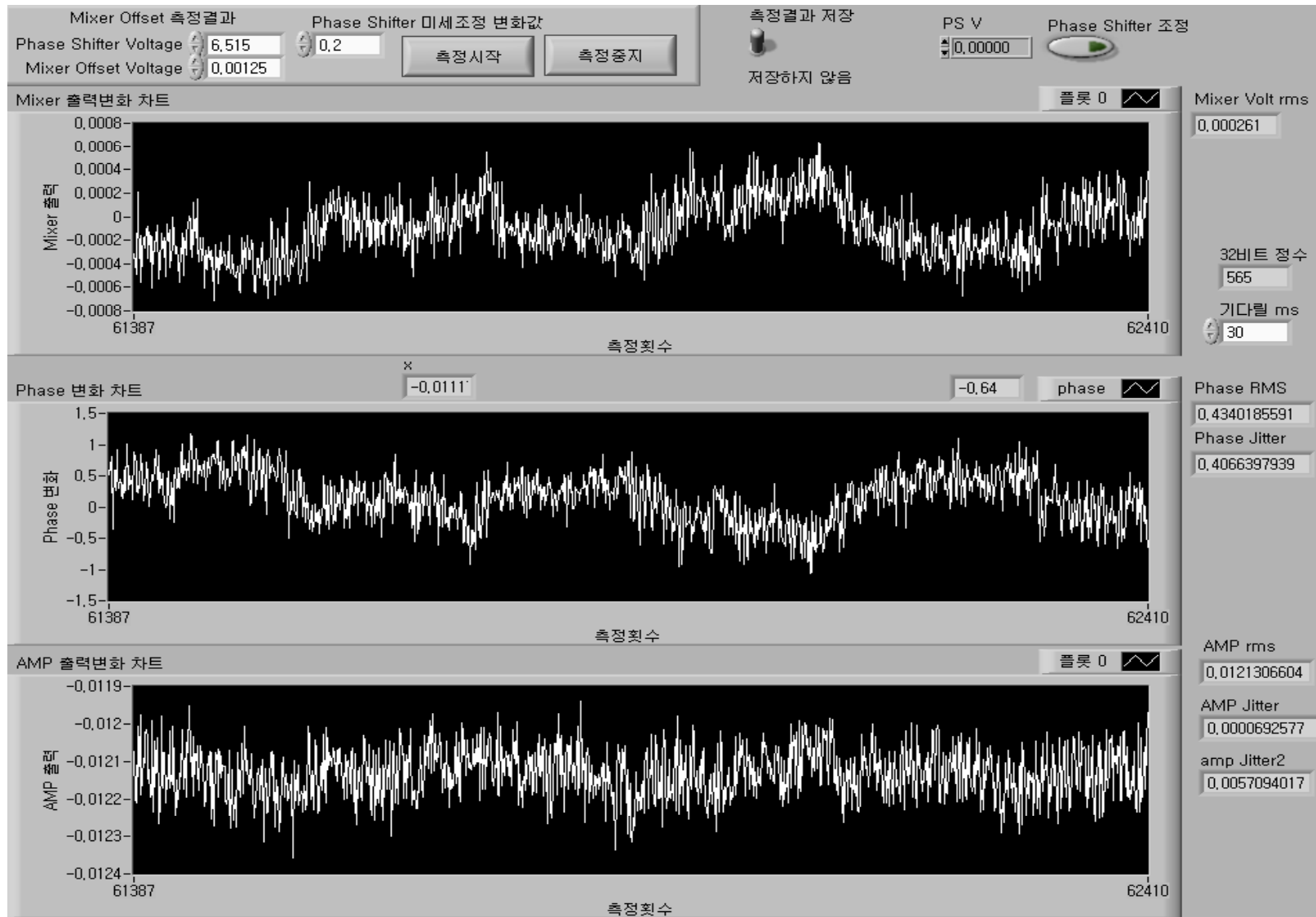
# Deqing\_ON Feedforward\_off

0.37 degrees/0.61%



# Deqing\_ON Feedforward\_on

0.41 degrees/0.57%



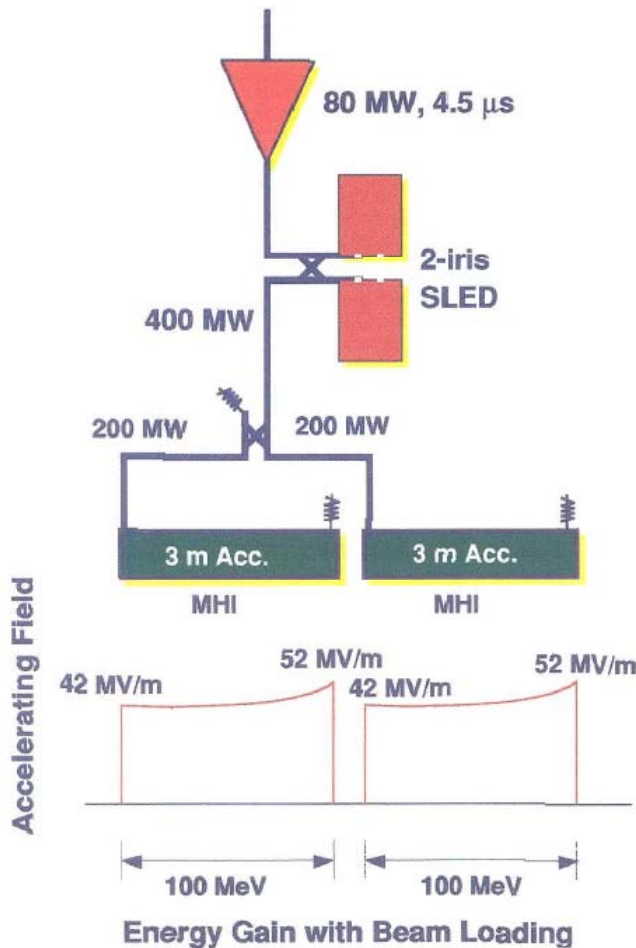
# Summary

Mode	Klystron		SLED	
	Phase (deg.)	Amplitude (%)	Phase (deg.)	Amplitude (%)
DeQing off	0.51	0.2	0.36	0.46
DeQing on Feedforward off	0.34	0.073	0.38	0.43
DeQing on Feedforward on	0.21	0.068	0.38	0.44

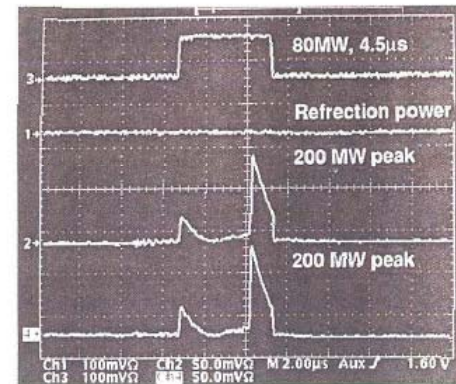
## Discussion

- Amplitude stability ; SLED out  $\sim 3$  x klystron out
  - why?
  - experience in ATF ?
  - test in ATF?
  
- For mitsubishi accelerating column
  - using SLED ?
  - using two feed coupler ?

# S-band 3m Mitsubishi Accelerating Column High Power Operation of the ATF 1.54GeV Linac Unit



Waveforms of RF Power



- 1st : Klystron output power, 80MW, 4.5μs
- 2nd : Refraction power from SLED+Acc.x2
- 3rd : Input power for left Acc., 200MW peak, 1μs
- 4th : Input power for right Acc., 200MW peak, 1μs

# S-band 3m Mitsubishi Accelerating Column 2 Feed Coupler

