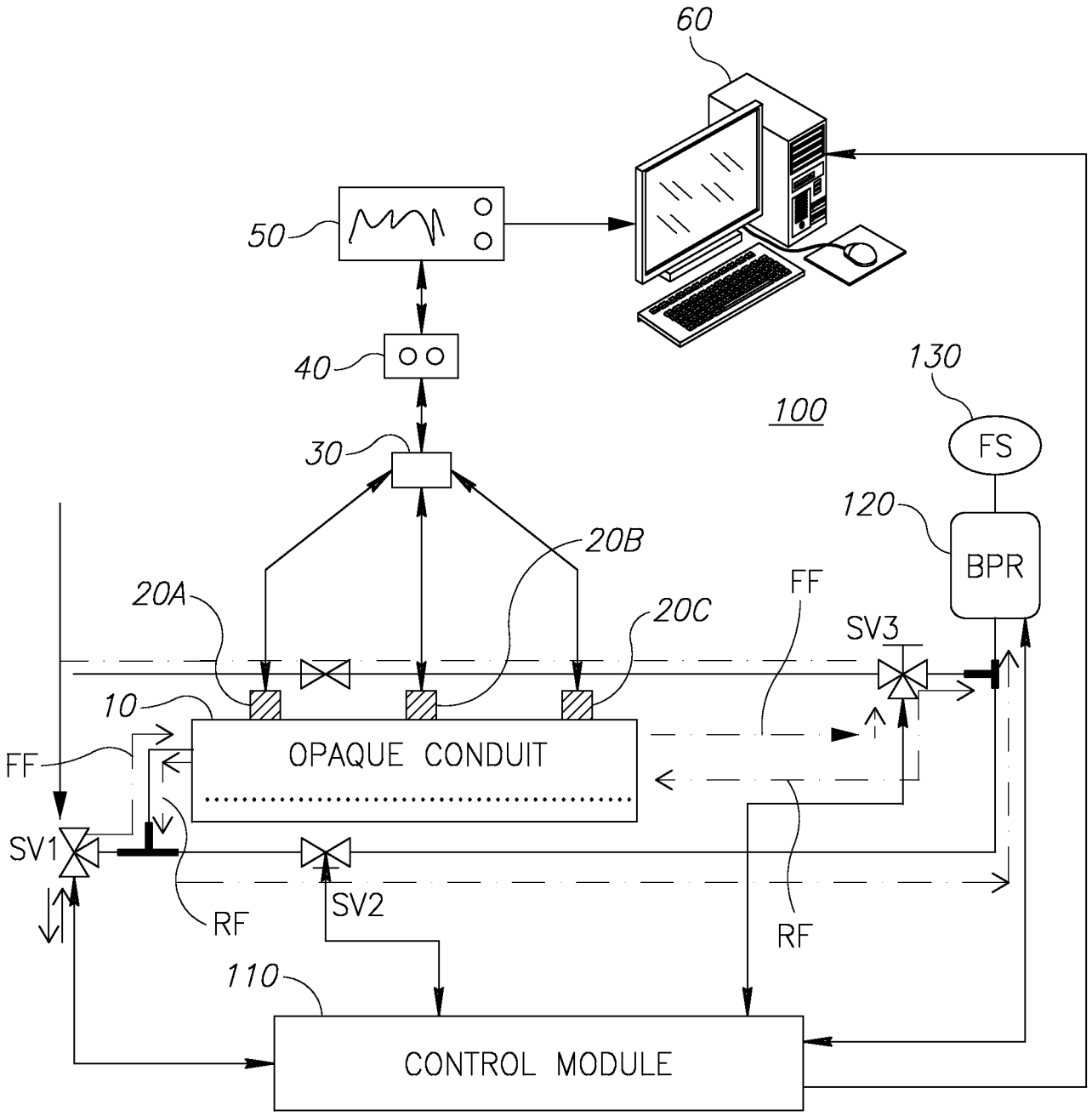

60
50
40
30
100
130
FS
120
BPR
20A
20B
20C
FF
SV3
10
OPAQUE CONDUIT
FF
SV1
RF
SV2
RF
110
CONTROL MODULE

Figure 1

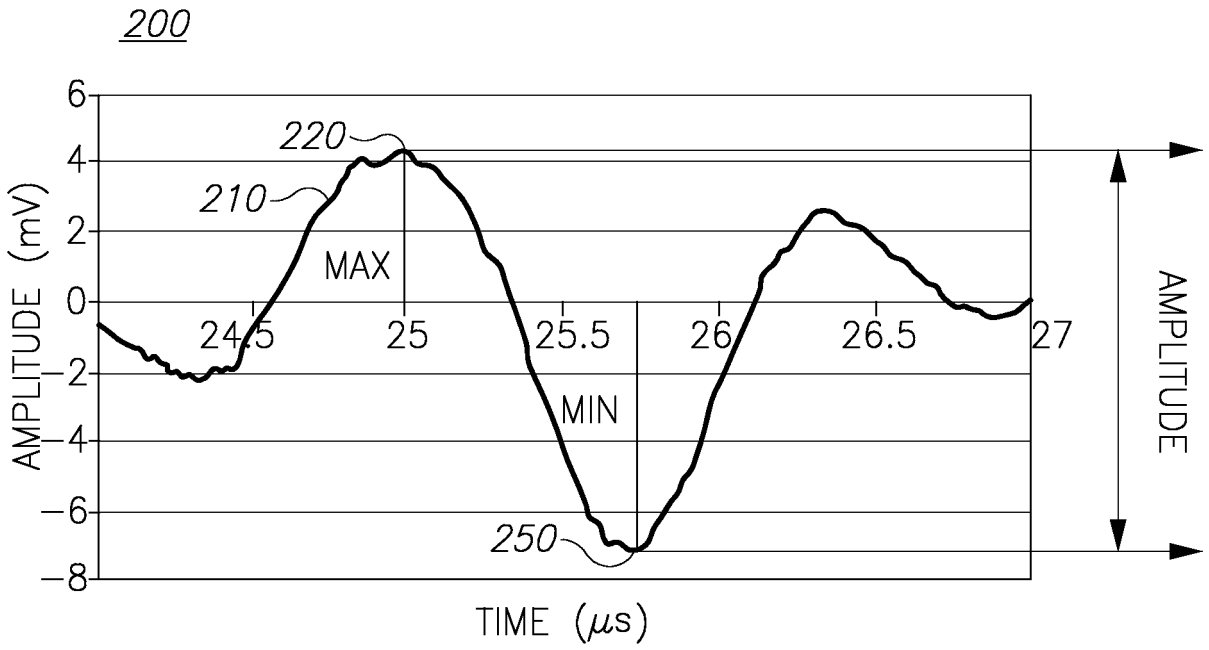


Figure 2

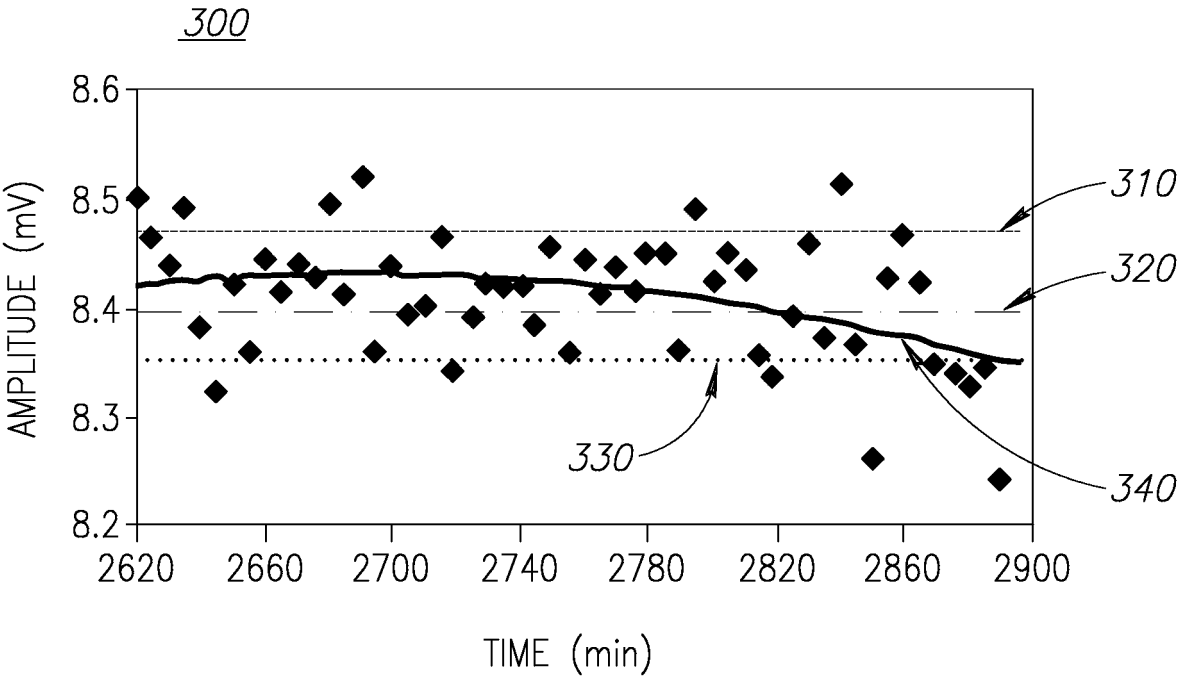


Figure 3

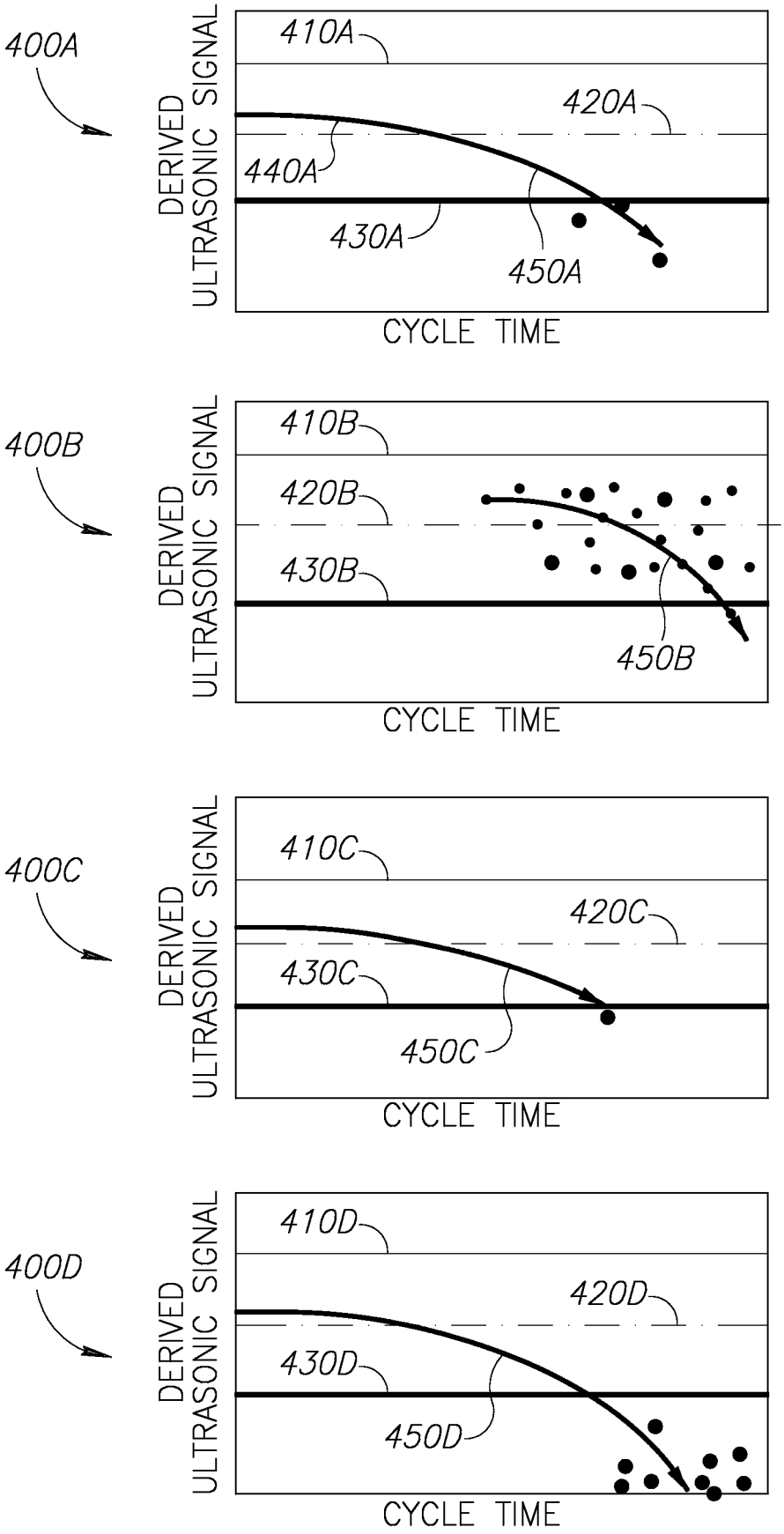

400A
410A
420A
440A
430A
450A
DERIVED ULTRASONIC SIGNAL
CYCLE TIME
400B
410B
420B
430B
450B
DERIVED ULTRASONIC SIGNAL
CYCLE TIME
400C
410C
420C
430C
450C
DERIVED ULTRASONIC SIGNAL
CYCLE TIME
400D
410D
420D
430D
450D
DERIVED ULTRASONIC SIGNAL
CYCLE TIME

Figure 4

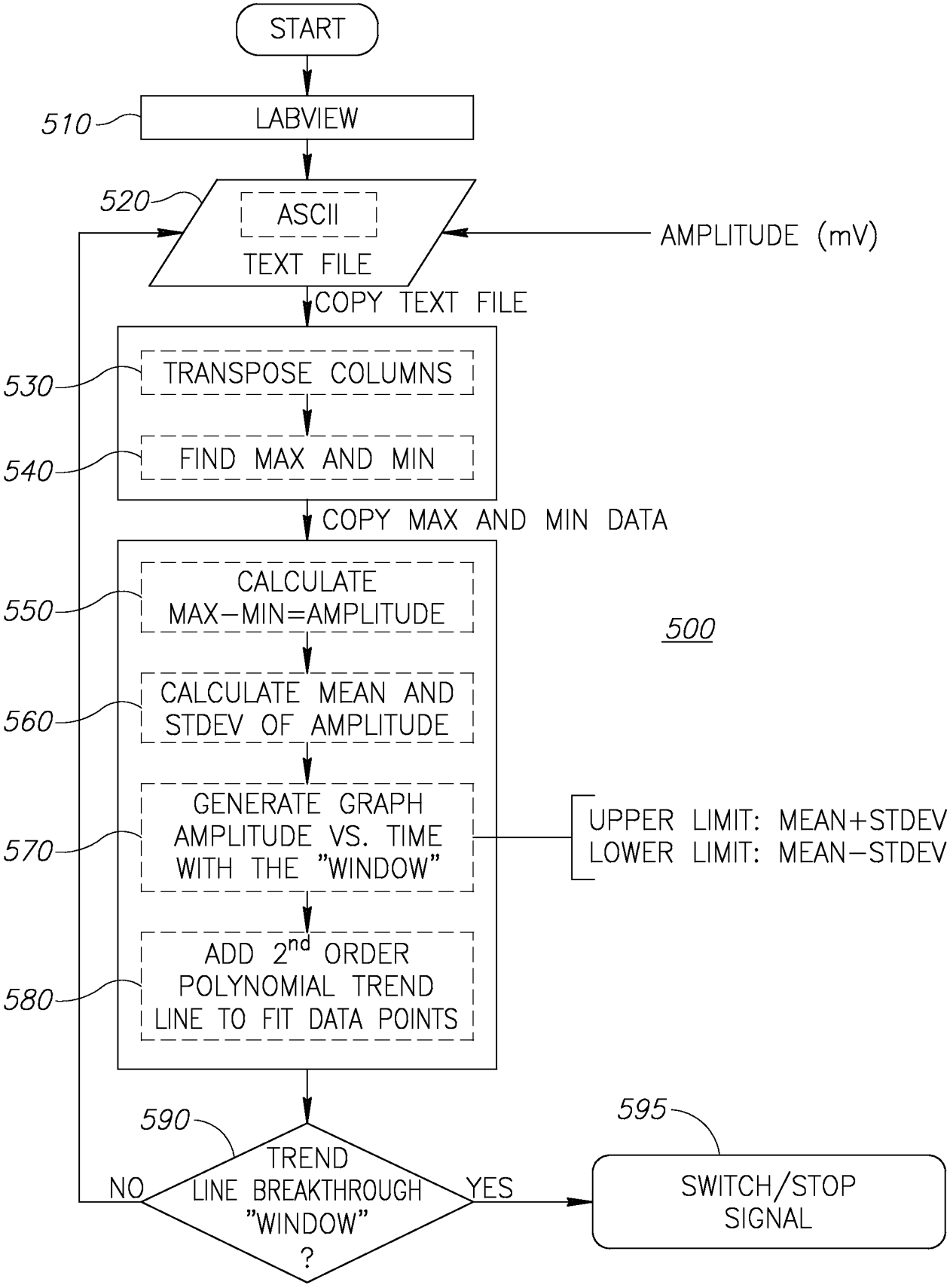

START
510
LABVIEW
520
ASCII
TEXT FILE
AMPLITUDE (mV)
COPY TEXT FILE
530
TRANSPOSE COLUMNS
540
FIND MAX AND MIN
COPY MAX AND MIN DATA
550
CALCULATE
MAX−MIN=AMPLITUDE
500
560
CALCULATE MEAN AND
STDEV OF AMPLITUDE
570
GENERATE GRAPH
AMPLITUDE VS. TIME
WITH THE "WINDOW"
UPPER LIMIT: MEAN+STDEV
LOWER LIMIT: MEAN−STDEV
580
ADD 2nd ORDER
POLYNOMIAL TREND
LINE TO FIT DATA POINTS
590
TREND
LINE BREAKTHROUGH
"WINDOW"
?
NO
YES
595
SWITCH/STOP
SIGNAL

Figure 5

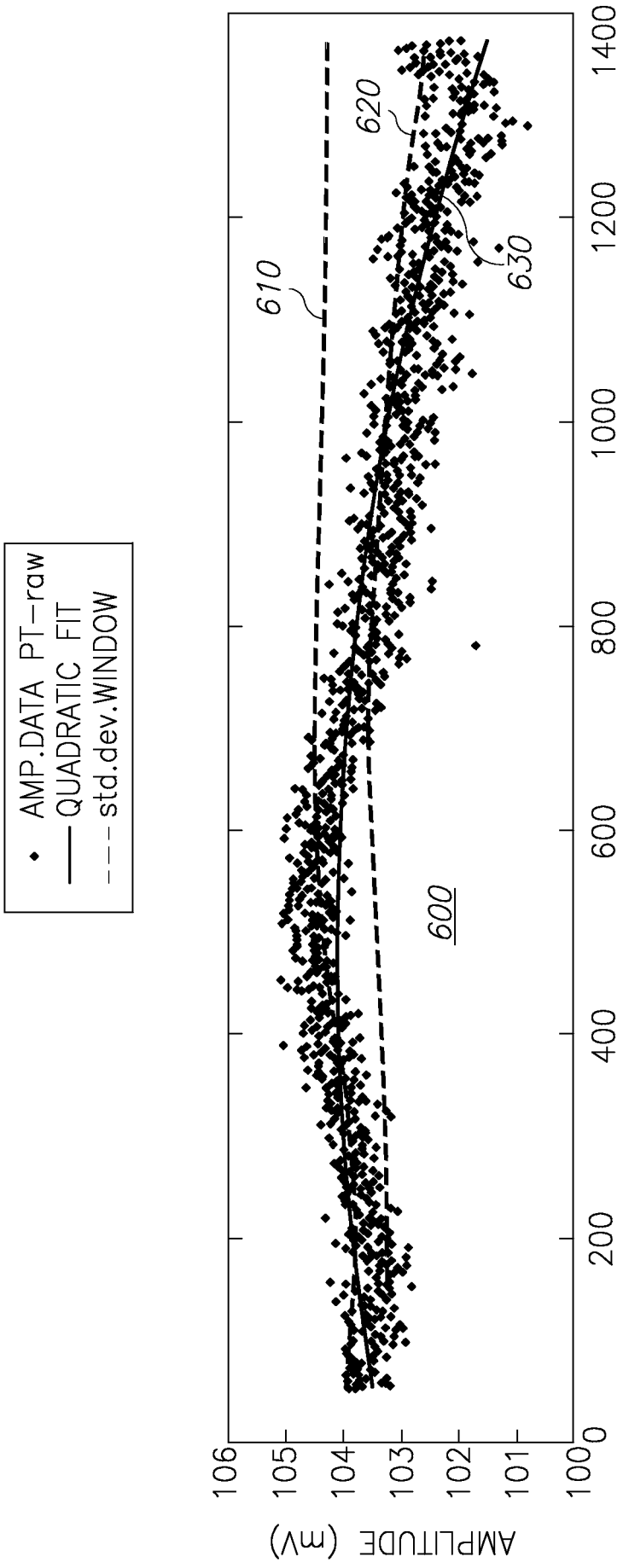

AMP.DATA PT-raw
QUADRATIC FIT
std.dev.WINDOW
610
620
630
600
AMPLITUDE (mV)
TIME (min)
100
101
102
103
104
105
106
0
200
400
600
800
1000
1200
1400

Figure 6

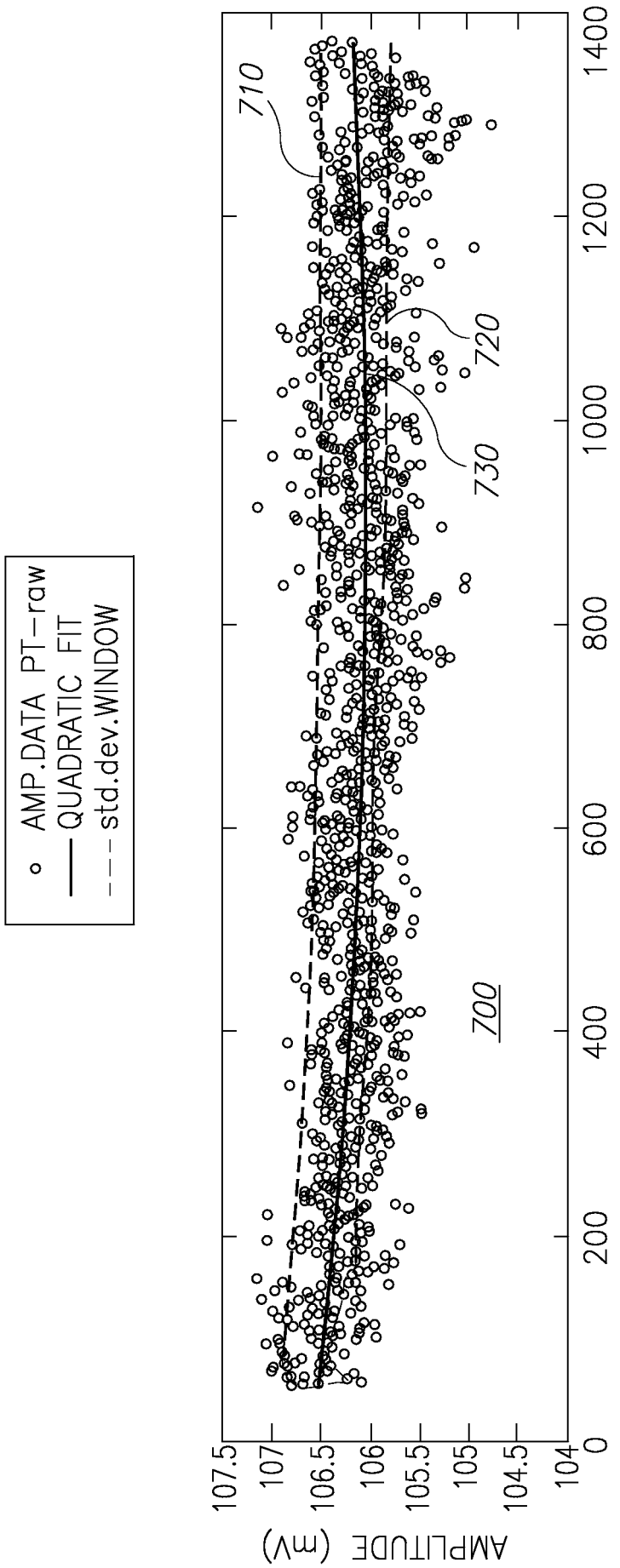

AMP.DATA PT-raw
QUADRATIC FIT
std.dev.WINDOW
710
720
730
700
AMPLITUDE (mV)
TIME (min)
107.5
107
106.5
106
105.5
105
104.5
104
0
200
400
600
800
1000
1200
1400

Figure 7

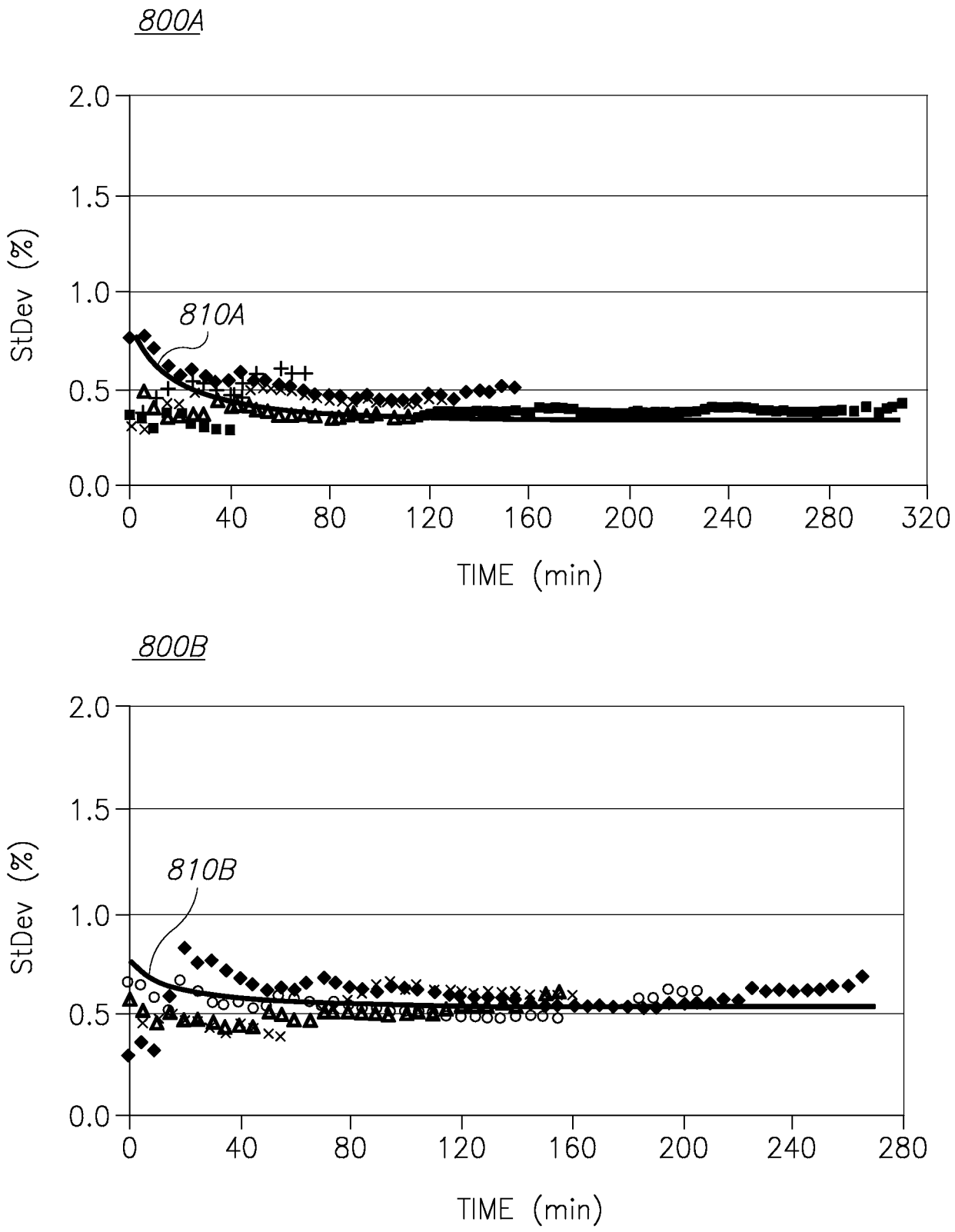
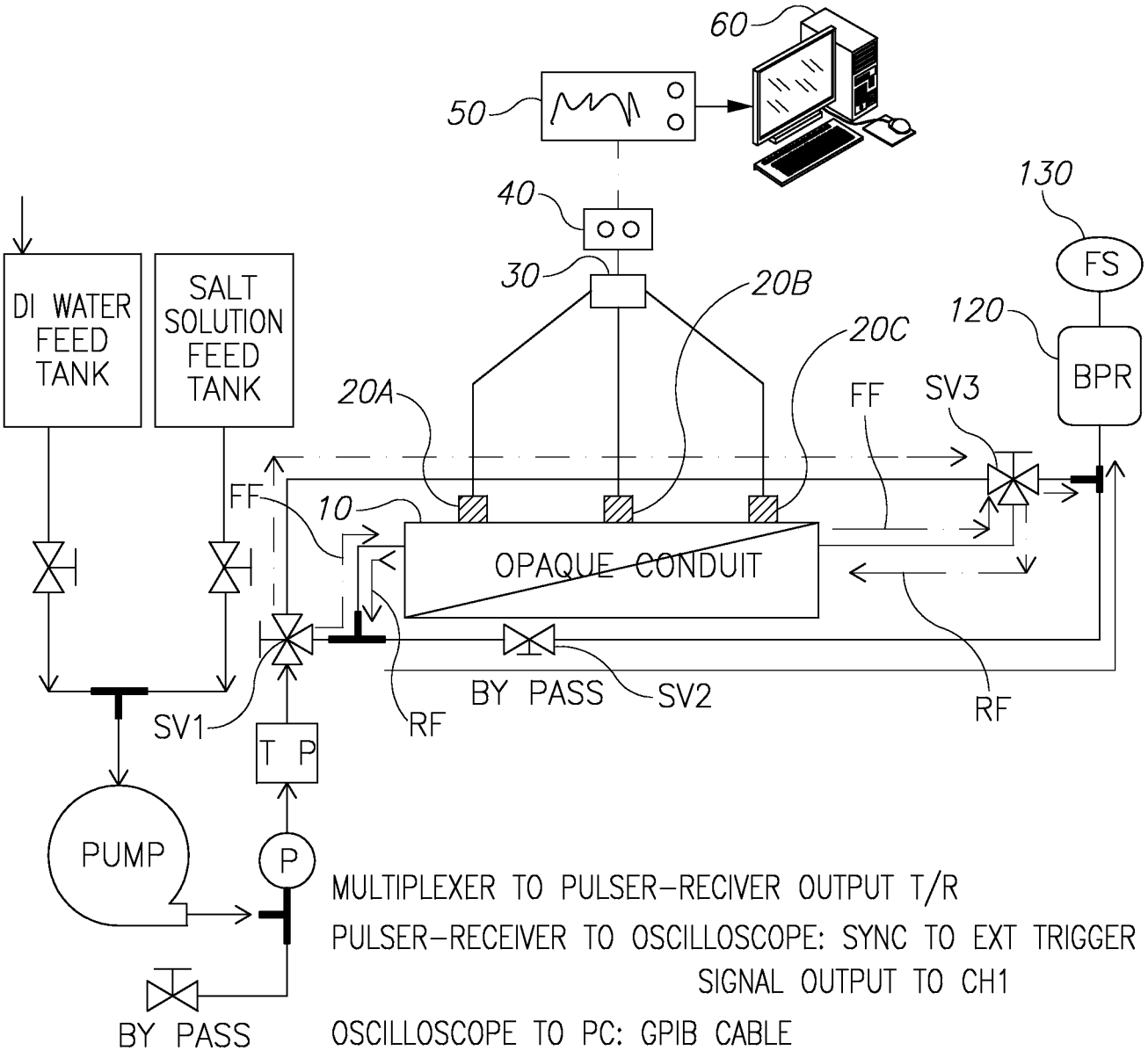

800A
2.0
1.5
1.0
0.5
0.0
StDev (%)
810A
0
40
80
120
160
200
240
280
320
TIME (min)
800B
2.0
1.5
1.0
0.5
0.0
StDev (%)
810B
0
40
80
120
160
200
240
280
TIME (min)

Figure 8


60
50
40
30
20B
20C
20A
130
FS
120
BPR
FF
SV3
DI WATER FEED TANK
SALT SOLUTION FEED TANK
FF
10
OPAQUE CONDUIT
BY PASS
SV2
RF
RF
SV1
T P
PUMP
P
BY PASS
MULTIPLEXER TO PULSER-RECIVER OUTPUT T/R
PULSER-RECEIVER TO OSCILLOSCOPE: SYNC TO EXT TRIGGER
SIGNAL OUTPUT TO CH1
OSCILLOSCOPE TO PC: GPIB CABLE
P: PRESSURE GAUGE
P: PT PRESSURE TRANSDUCER
BPR:BACK PRESSURE REGULATOR
FS: FLOW SENSOR

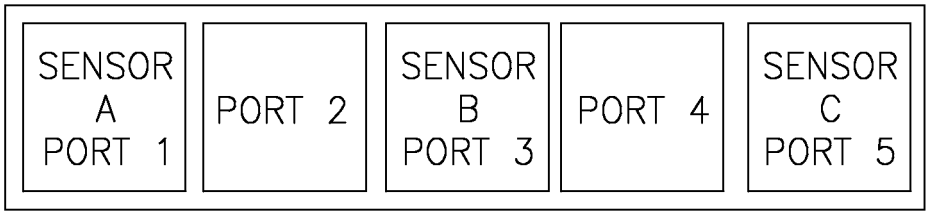

SENSOR A PORT 1
PORT 2
SENSOR B PORT 3
PORT 4
SENSOR C PORT 5

Figure 9

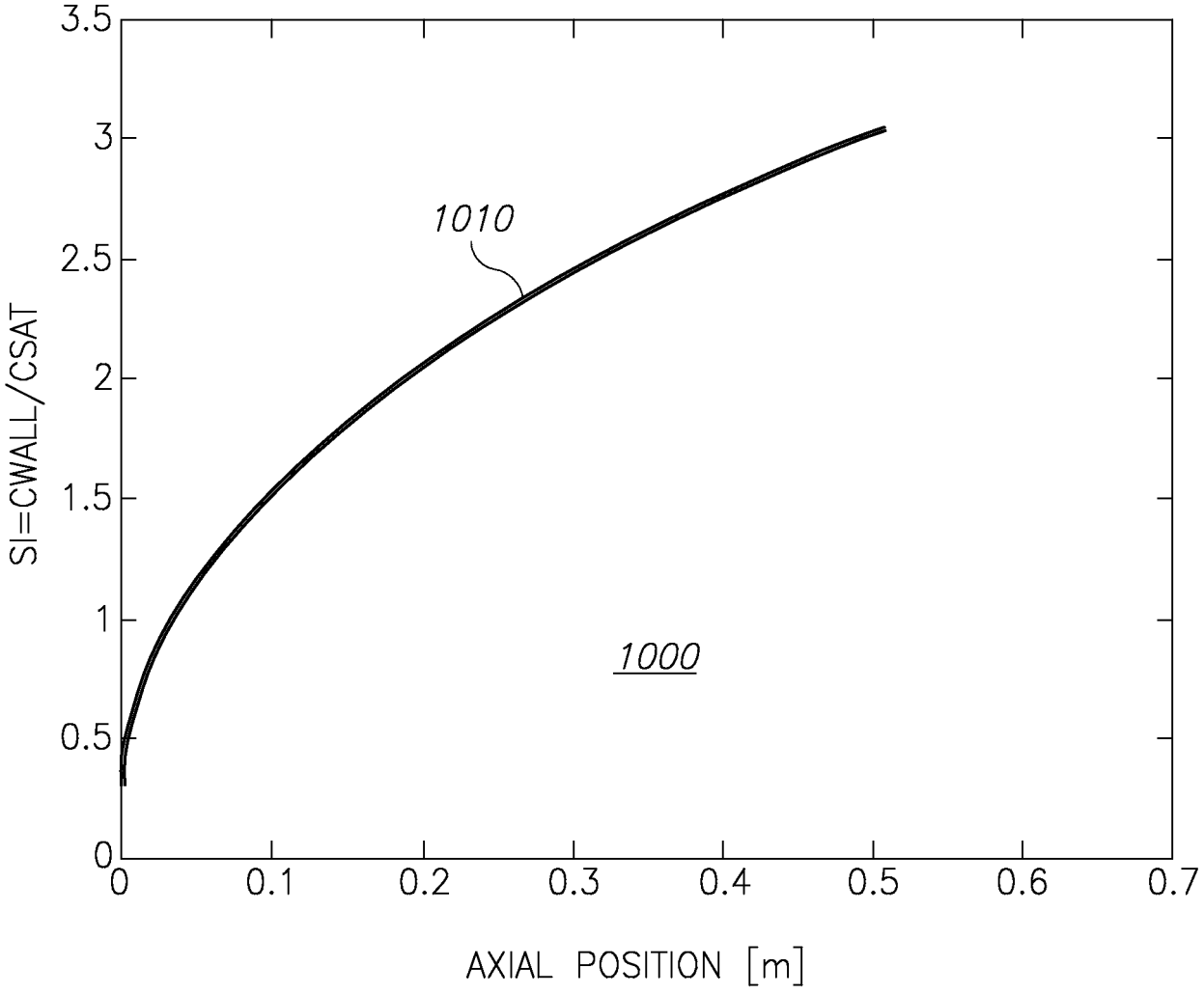

3.5
3
2.5
2
1.5
1
0.5
0
SI=CWALL/CSAT
1010
1000
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
AXIAL POSITION [m]

Figure 10

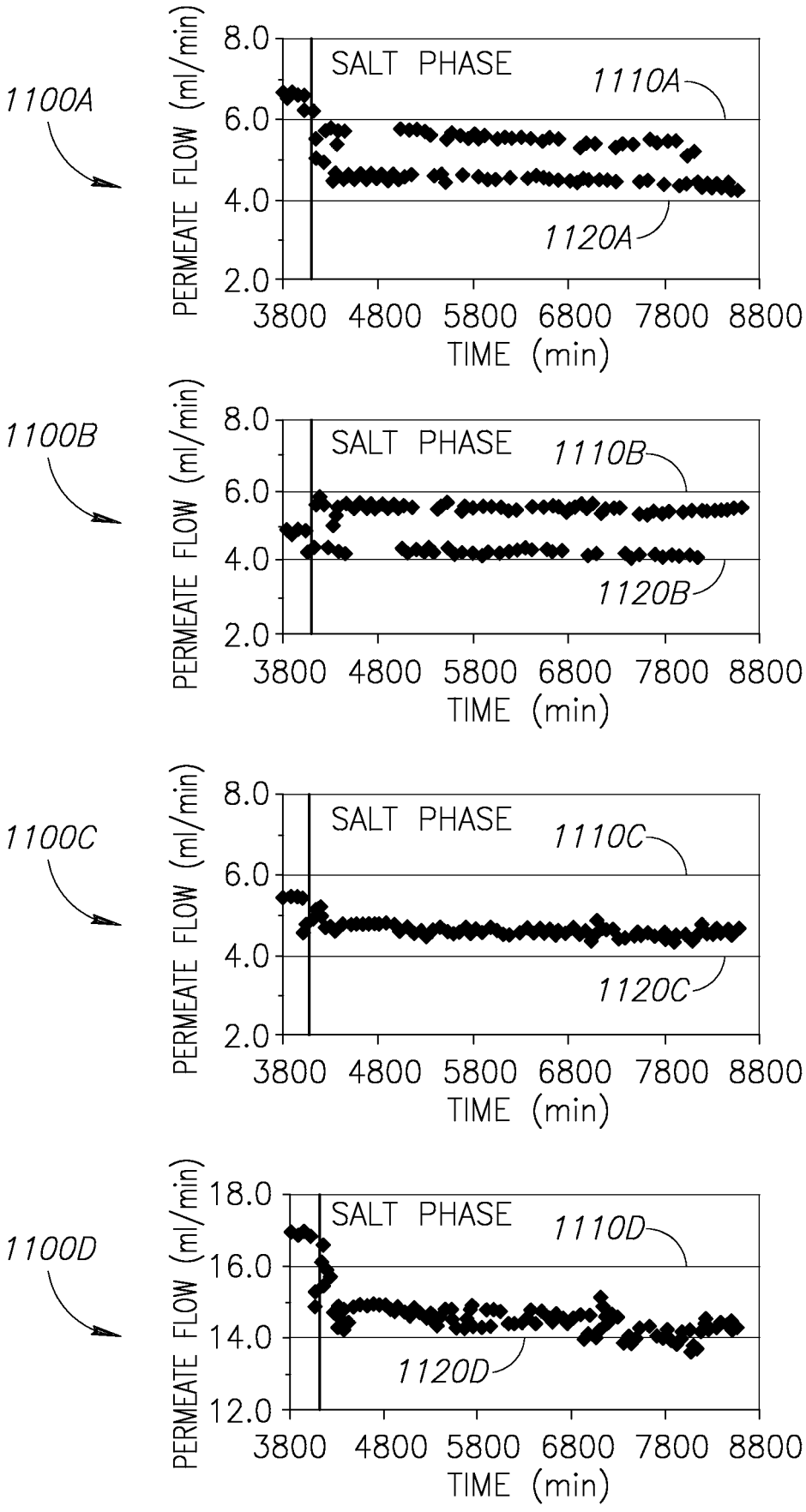

1100A
PERMEATE FLOW (ml/min)
8.0
6.0
4.0
2.0
SALT PHASE
1110A
1120A
3800 4800 5800 6800 7800 8800
TIME (min)
1100B
PERMEATE FLOW (ml/min)
8.0
6.0
4.0
2.0
SALT PHASE
1110B
1120B
3800 4800 5800 6800 7800 8800
TIME (min)
1100C
PERMEATE FLOW (ml/min)
8.0
6.0
4.0
2.0
SALT PHASE
1110C
1120C
3800 4800 5800 6800 7800 8800
TIME (min)
1100D
PERMEATE FLOW (ml/min)
18.0
16.0
14.0
12.0
SALT PHASE
1110D
1120D
3800 4800 5800 6800 7800 8800
TIME (min)

Figure 11

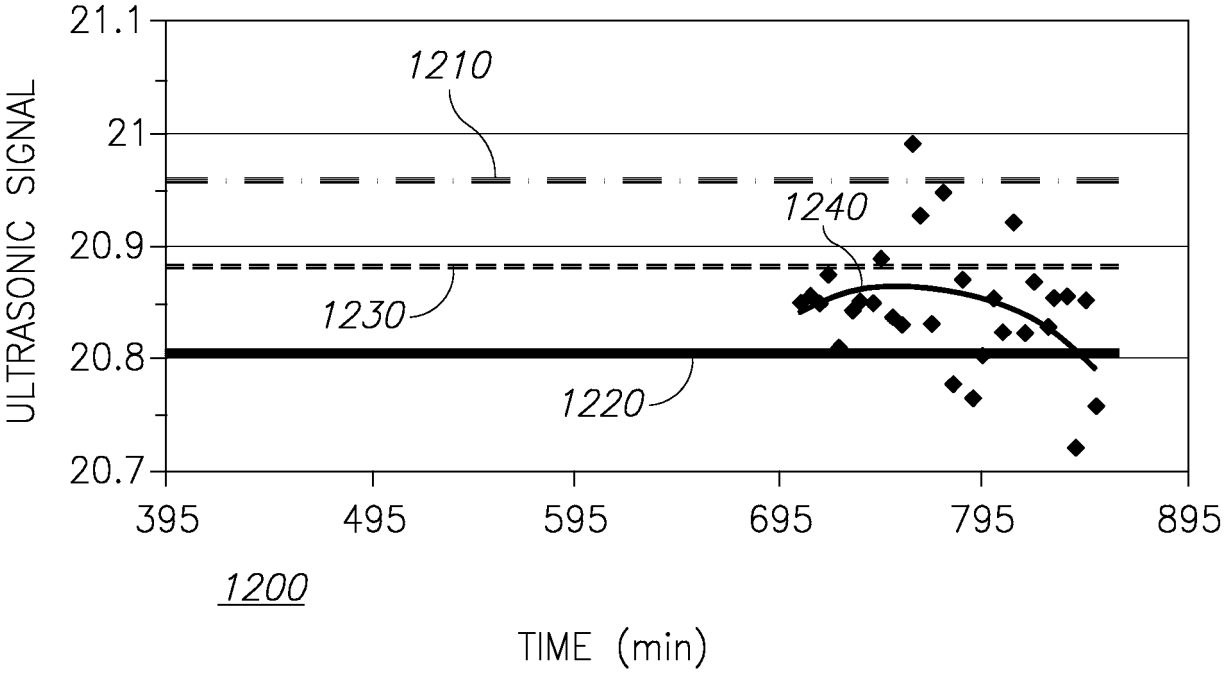


Figure 12

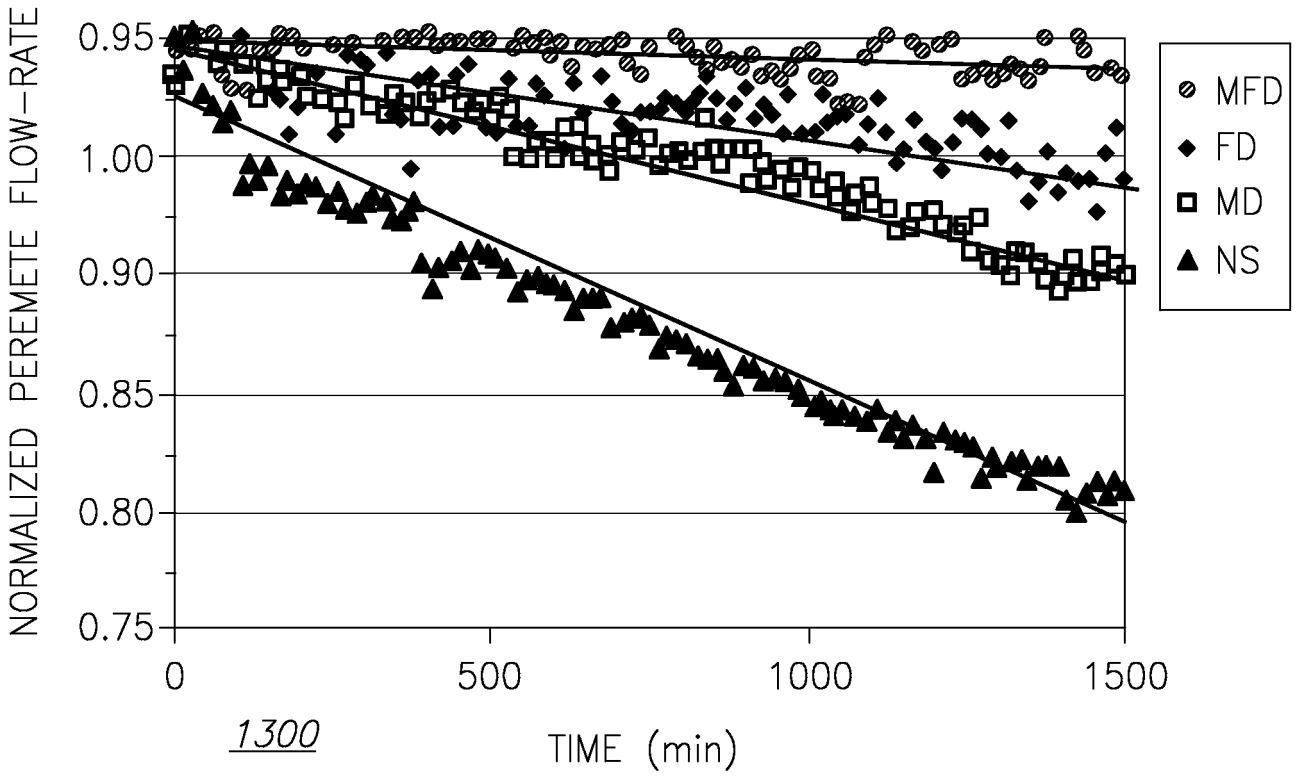


Figure 13

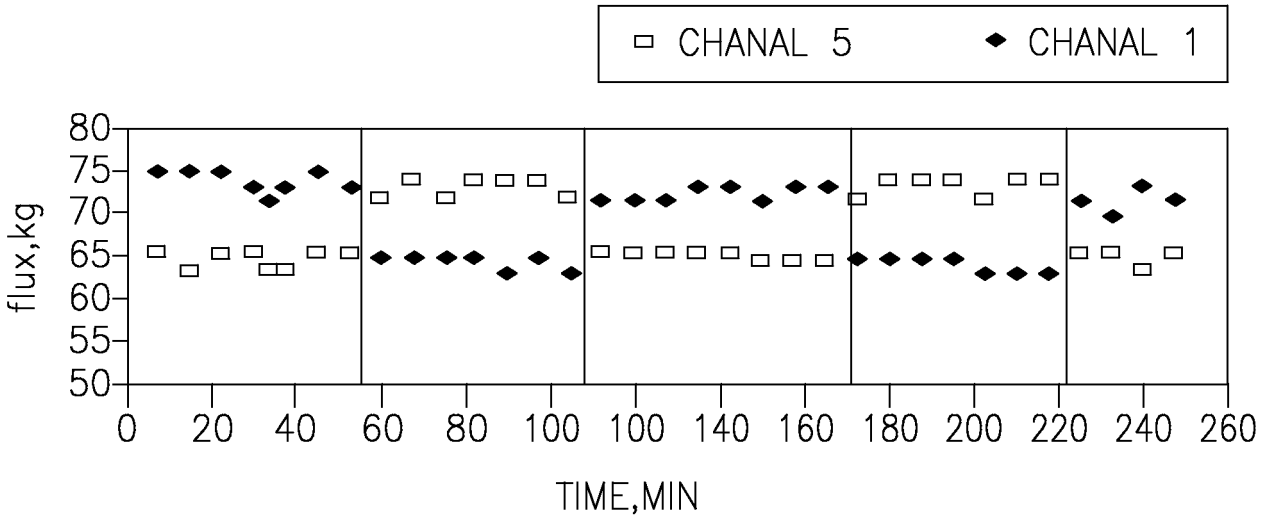


Figure 14

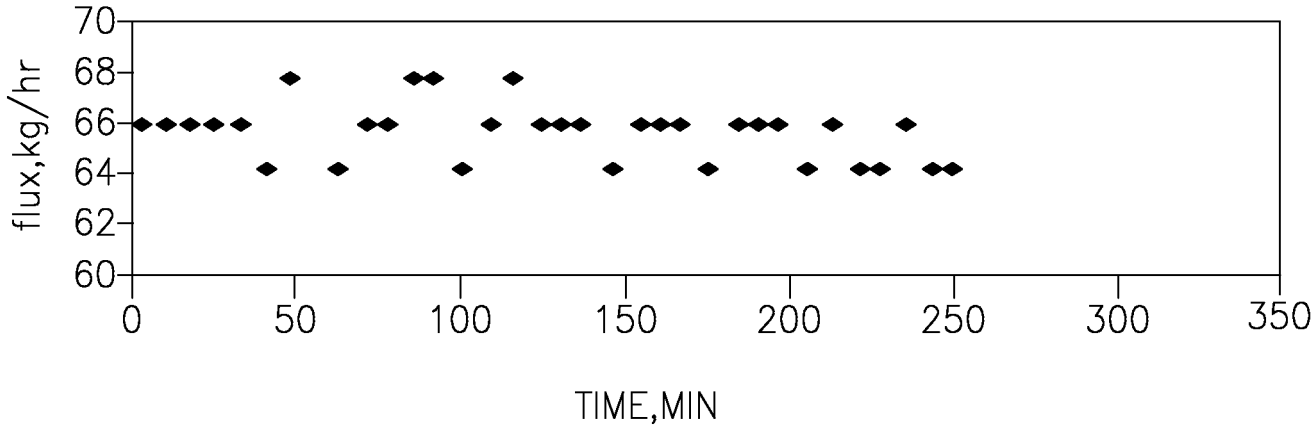


Figure 15

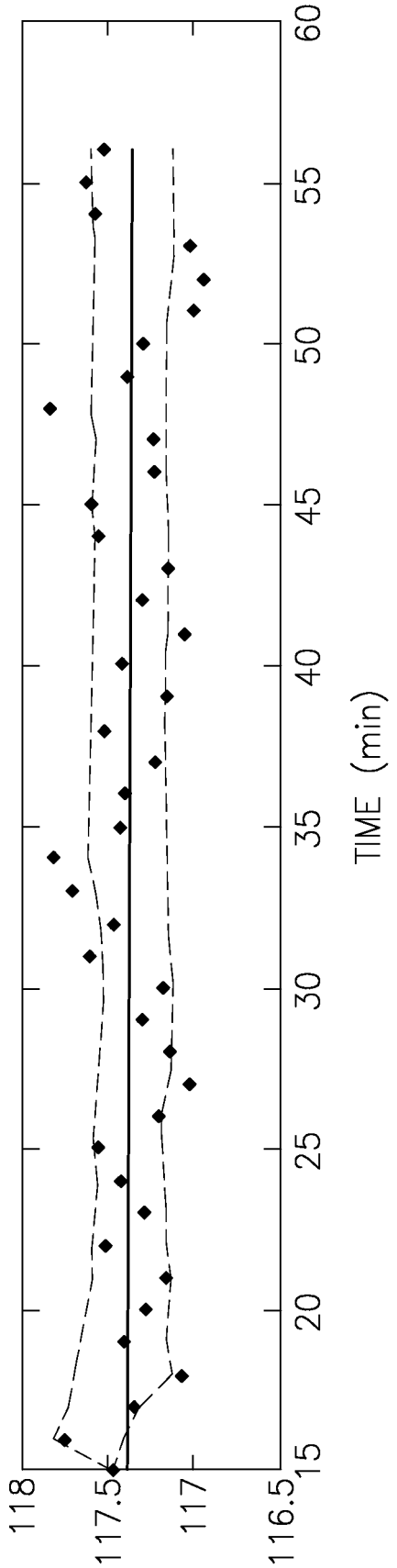


Figure 16

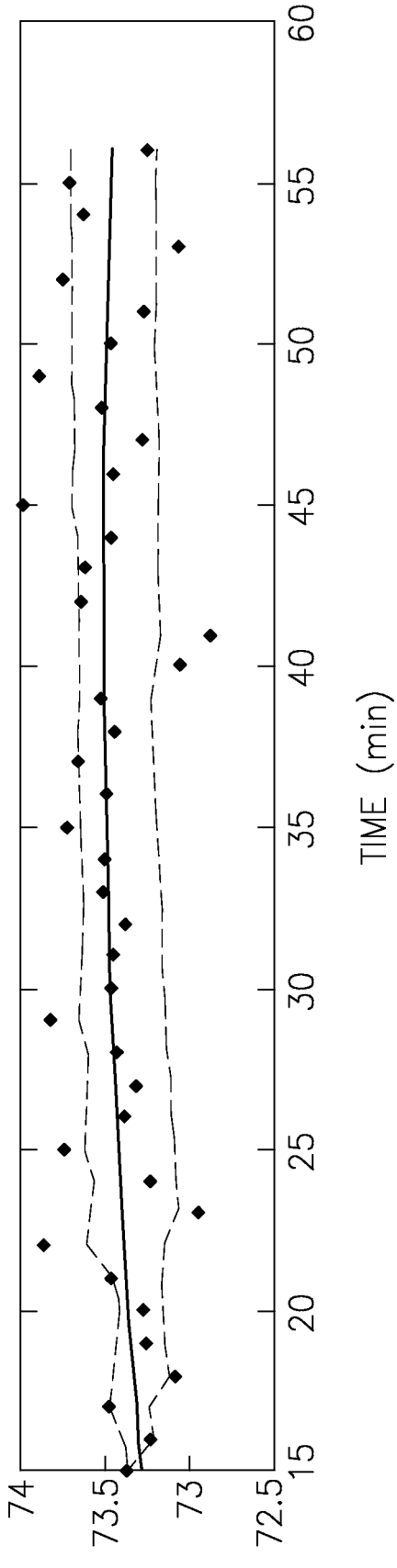


Figure 17

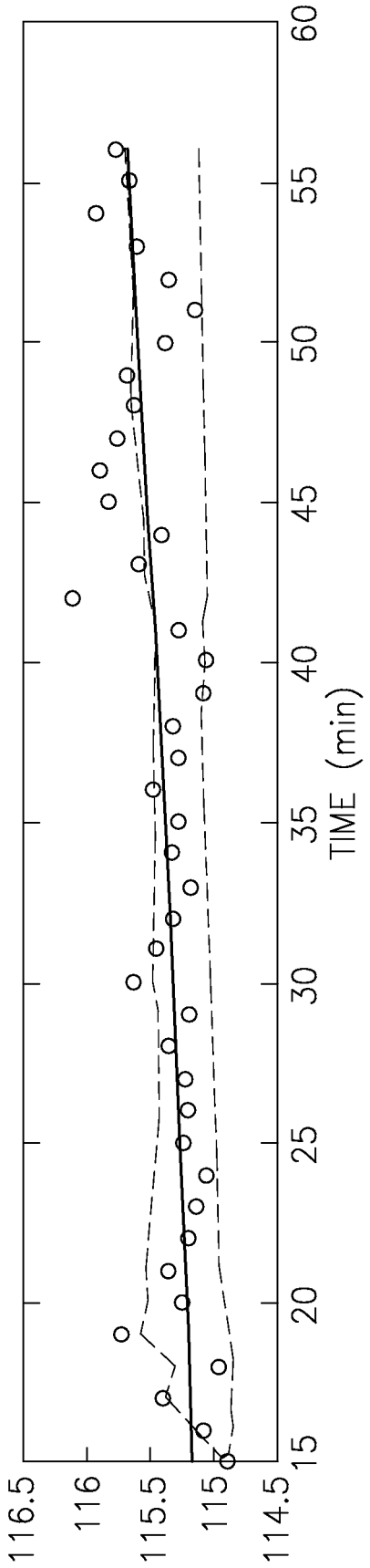


Figure 18

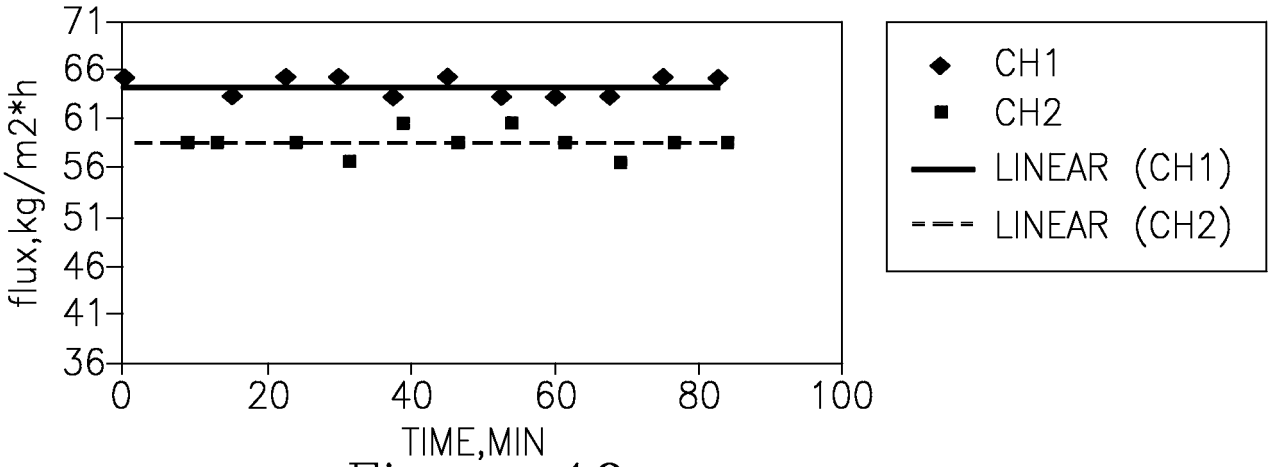


Figure 19

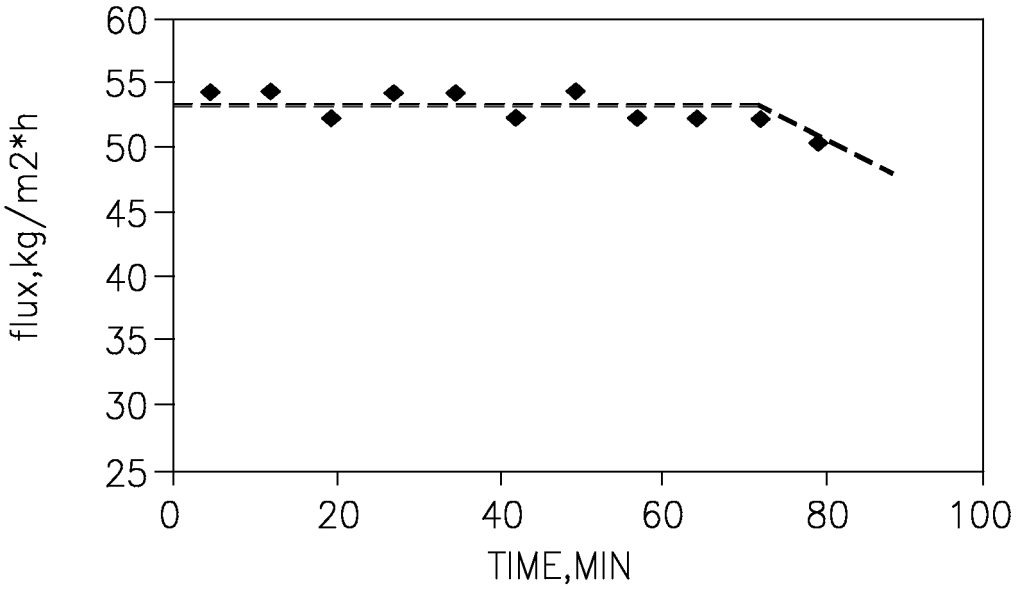


Figure 20

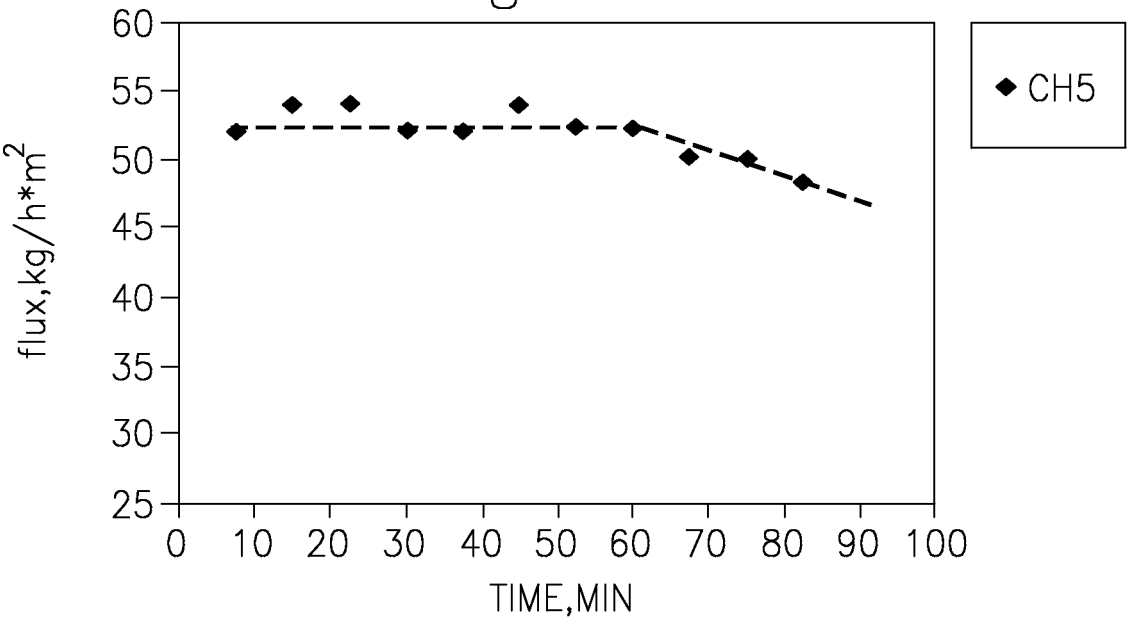


Figure 21

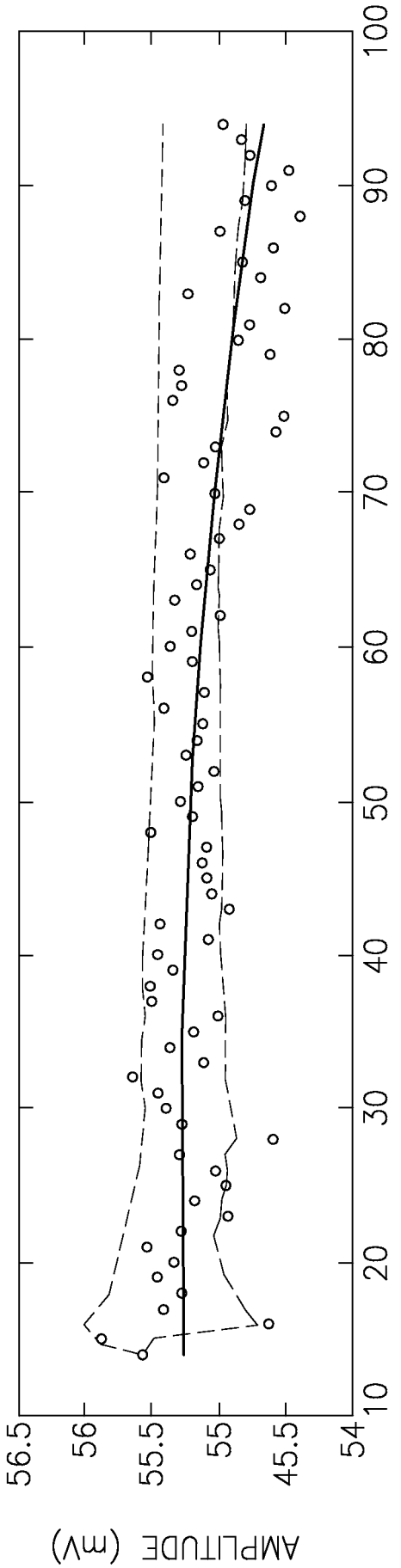


Figure 22

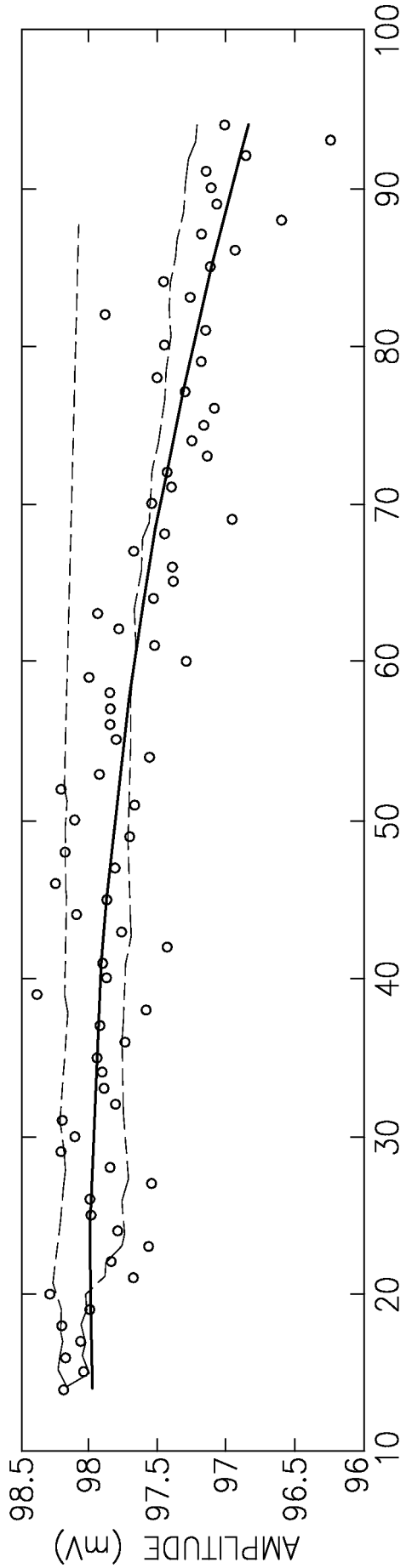


Figure 23