RADAR RCS SIMULATION

Group Members:

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Plane Shape

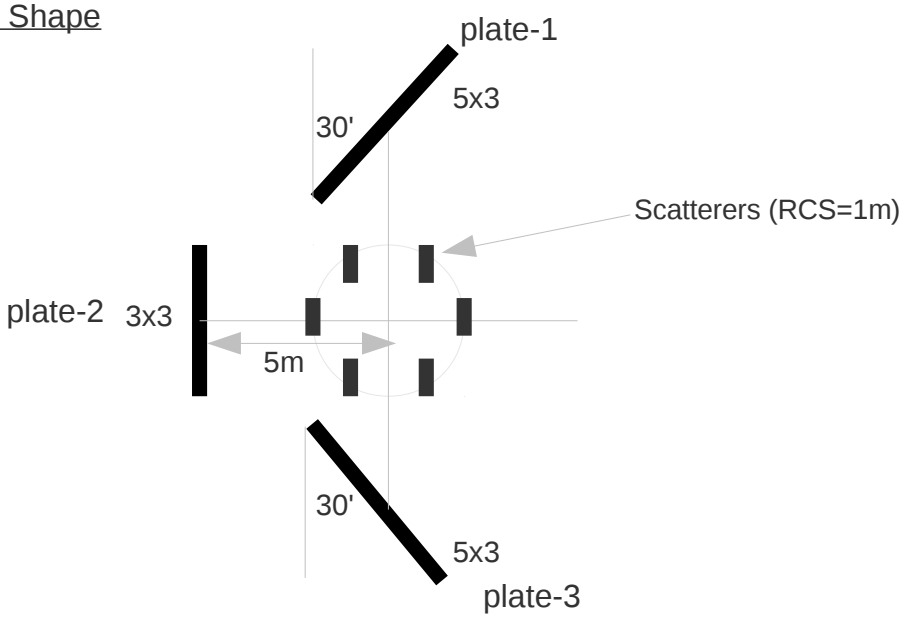
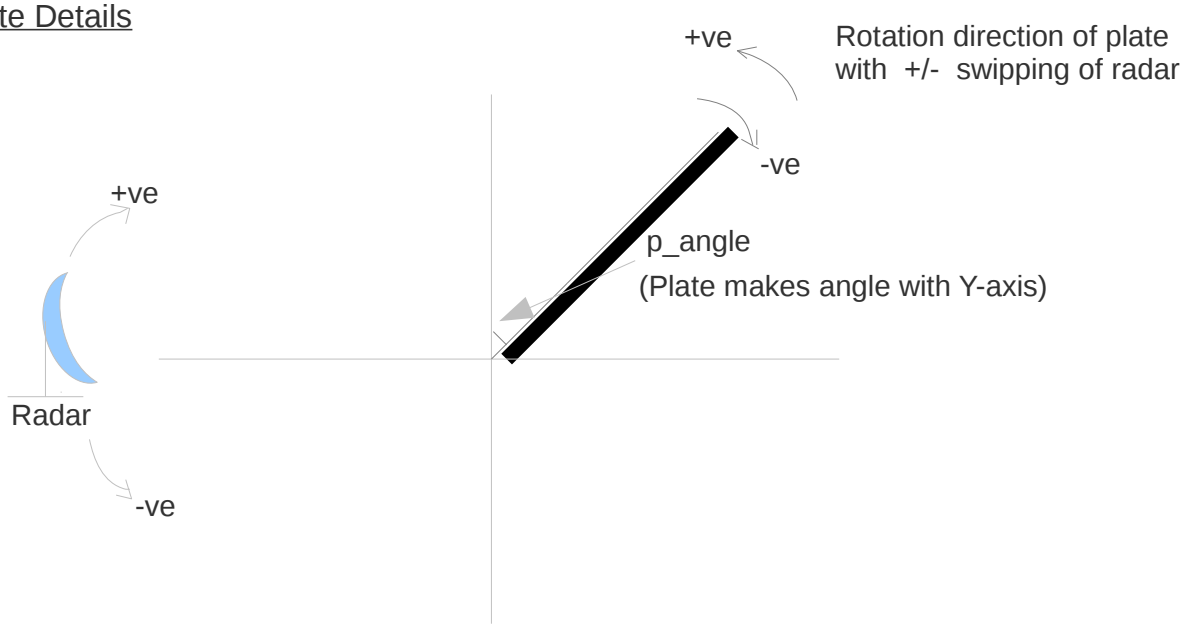
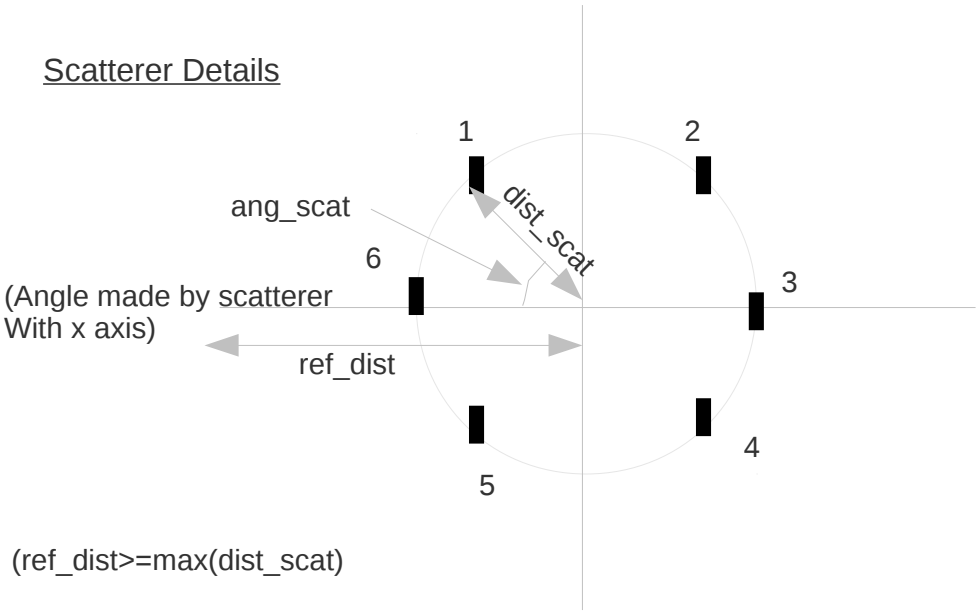


Plate Details

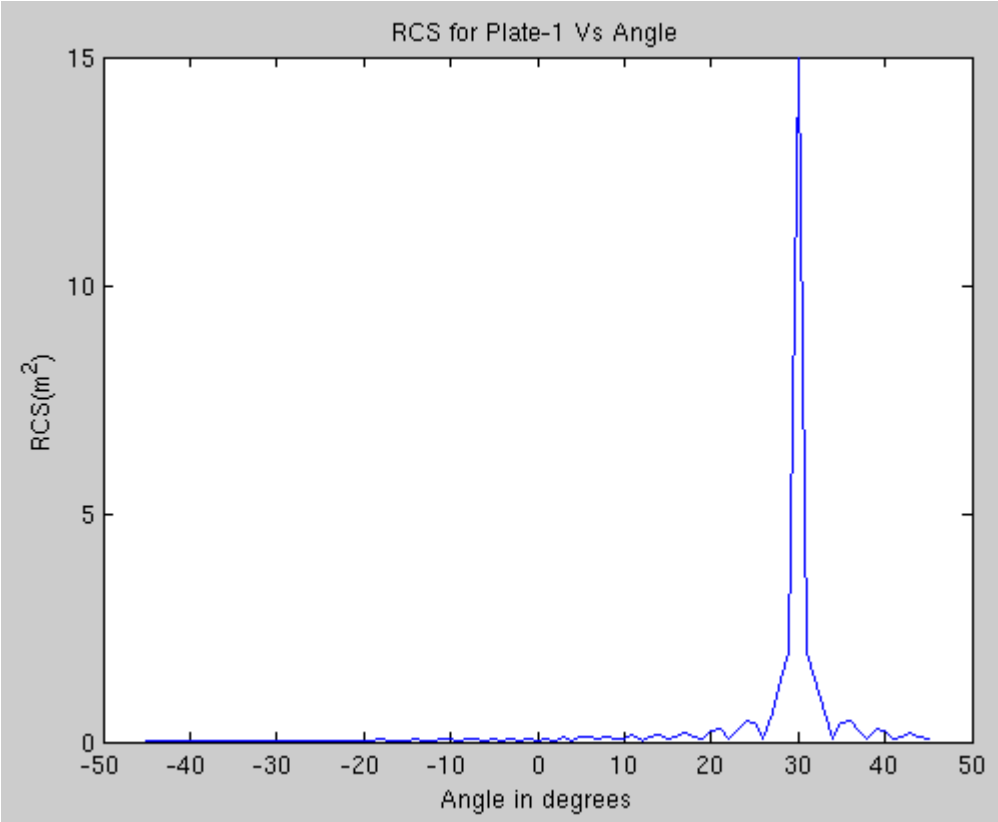


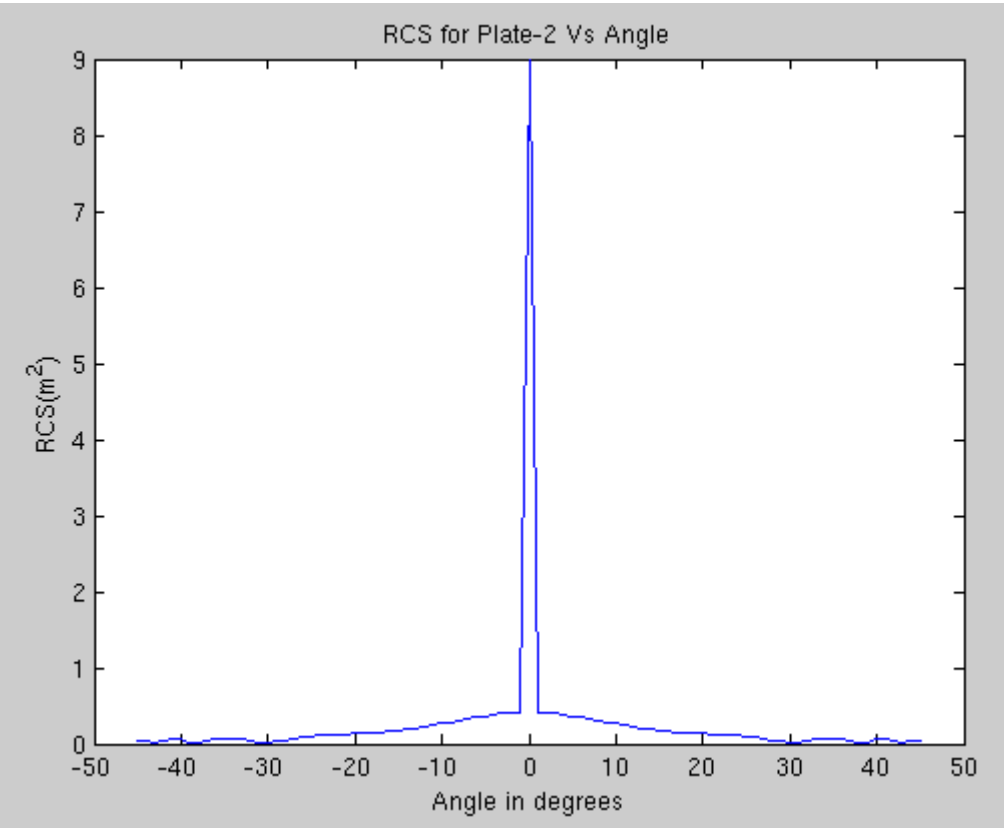
Scatterer Details

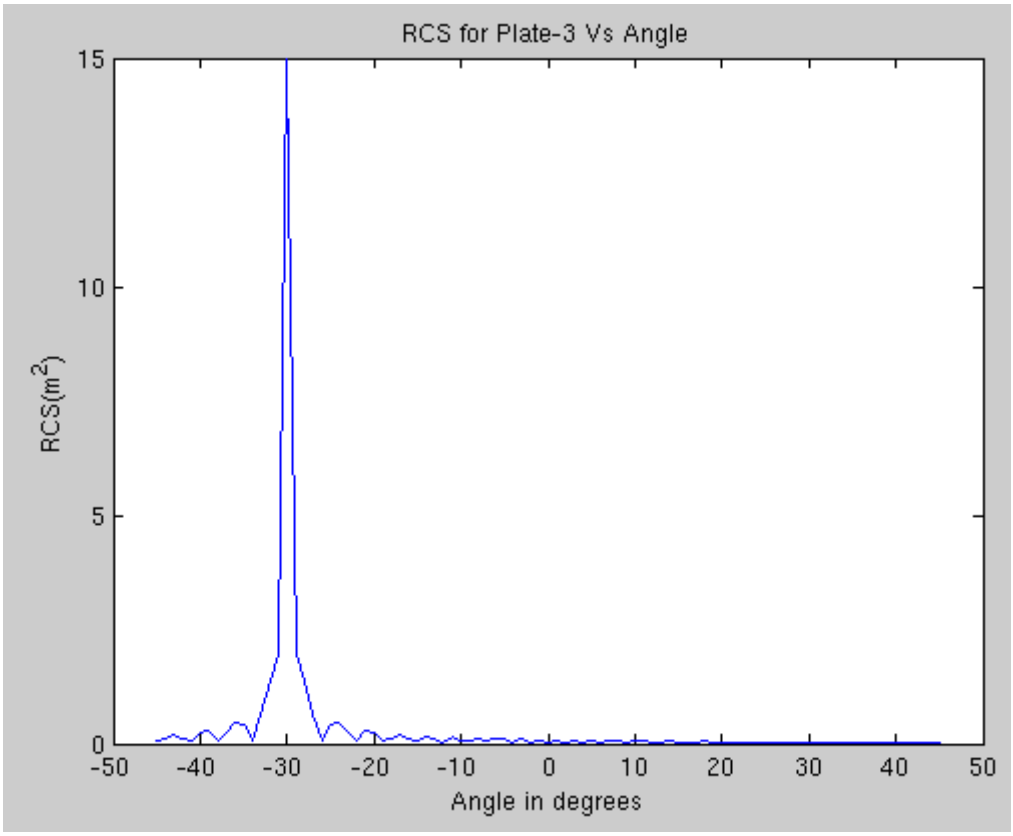


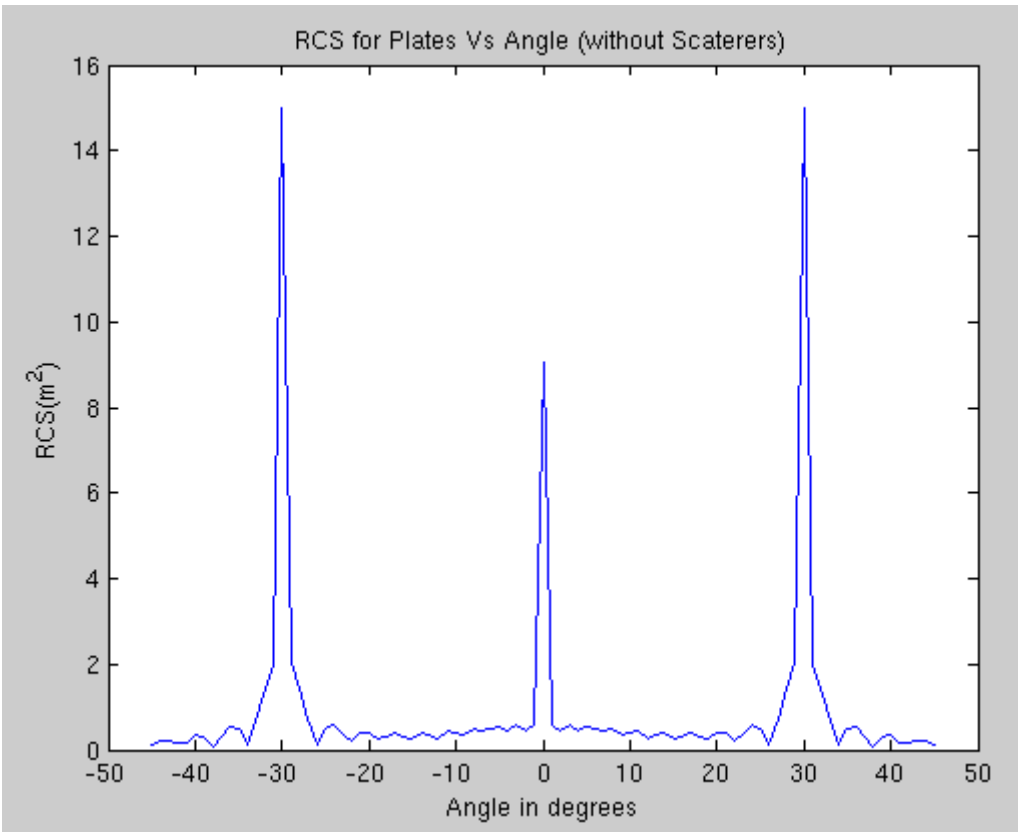
(ref_dist>=max(dist_scat)

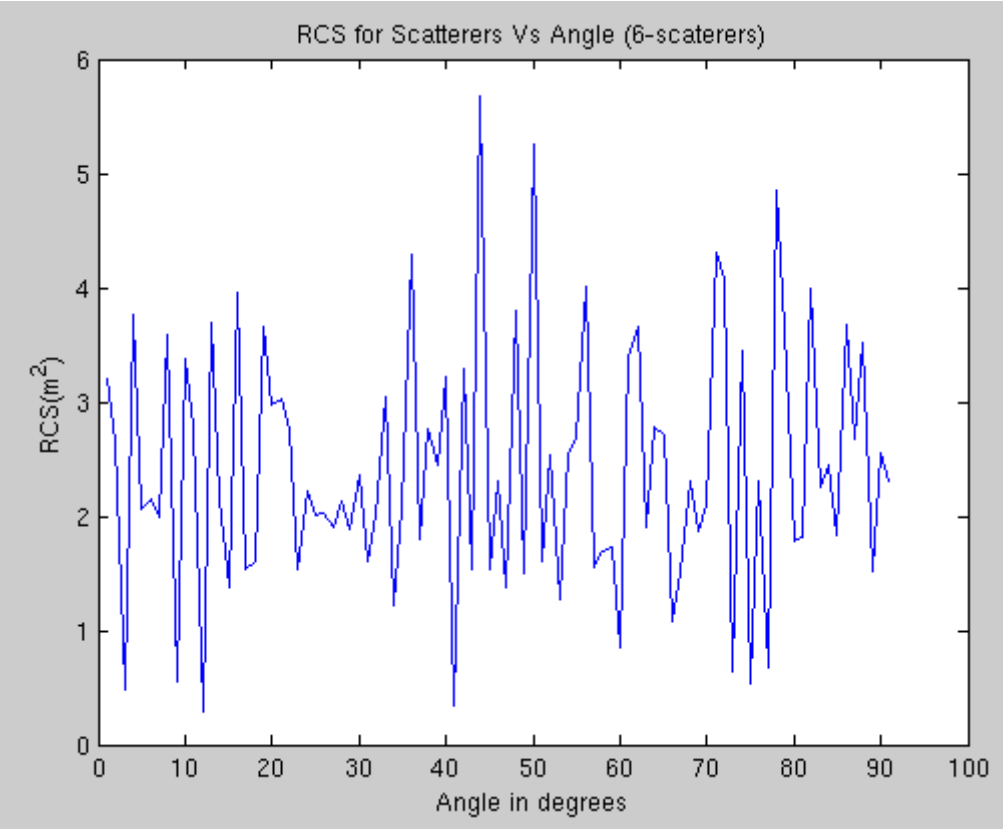
PLOTES

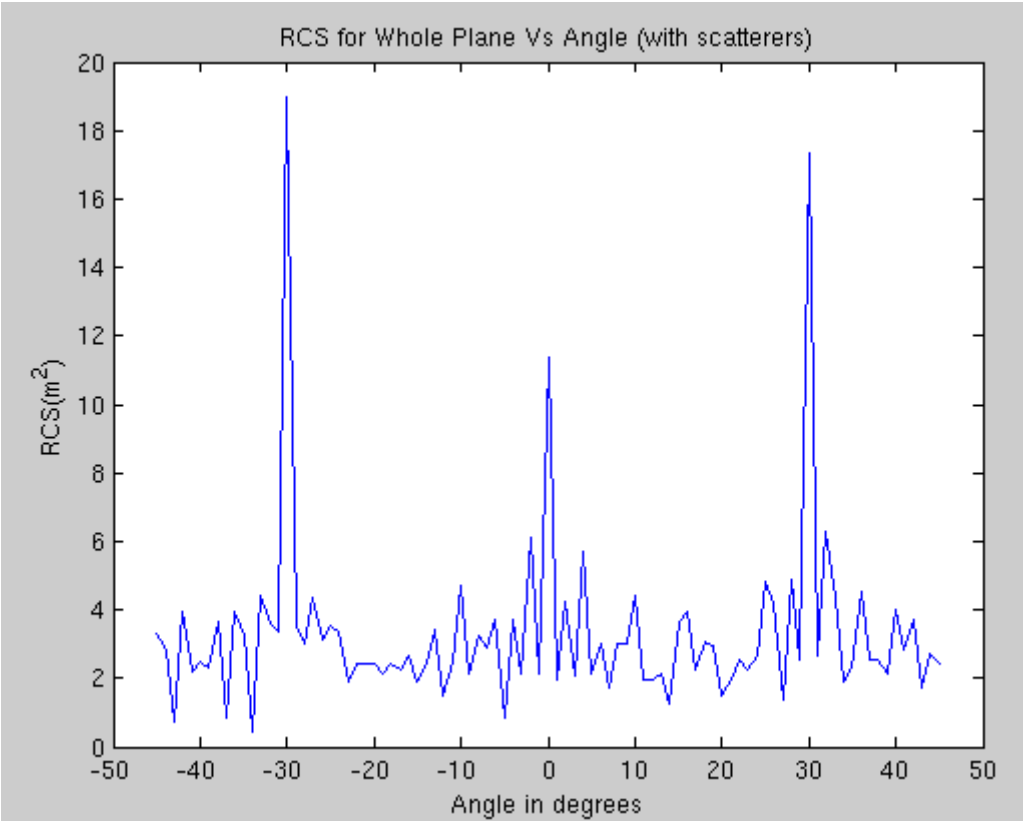

RCS for Plate-1 Vs Angle
RCS(m2)
Angle in degrees
15
10
5
0
-50
-40
-30
-20
-10
0
10
20
30
40
50

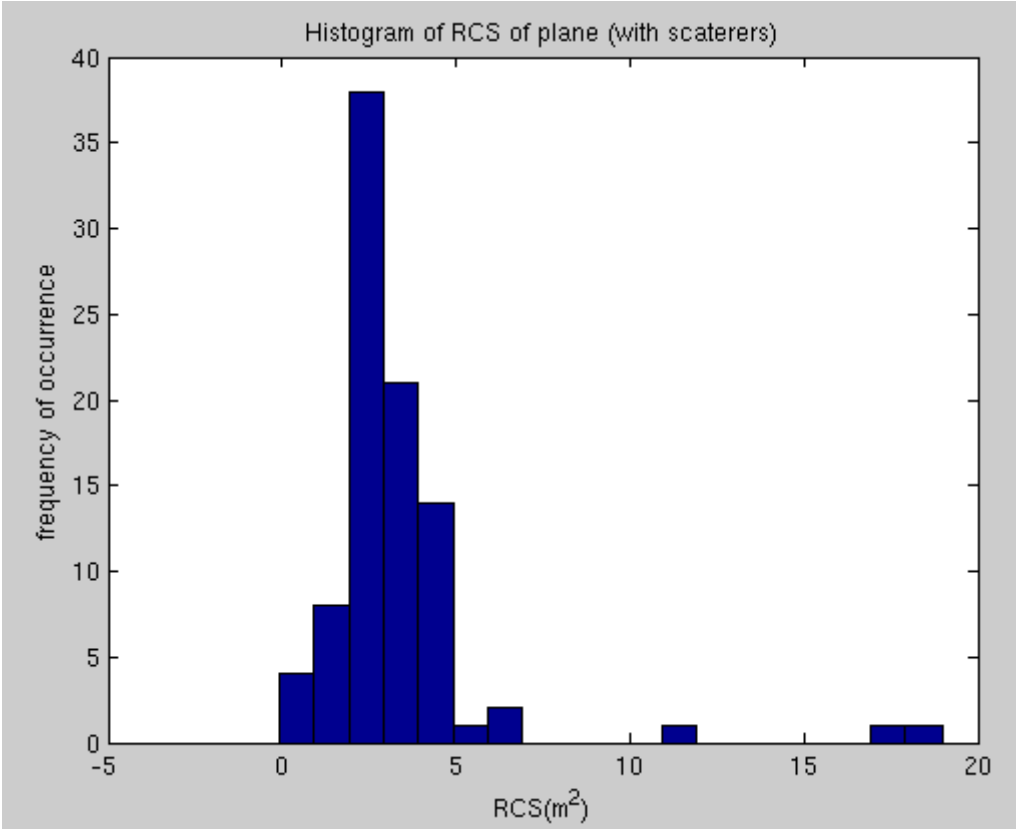

RCS for Plate-2 Vs Angle
RCS(m2)
Angle in degrees
9
8
7
6
5
4
3
2
1
0
-50
-40
-30
-20
-10
0
10
20
30
40
50


RCS for Plate-3 Vs Angle
RCS(m2)
Angle in degrees
15
10
5
0
-50
-40
-30
-20
-10
0
10
20
30
40
50


RCS for Plates Vs Angle (without Scaterers)
RCS(m2)
Angle in degrees
16
14
12
10
8
6
4
2
0
-50
-40
-30
-20
-10
0
10
20
30
40
50

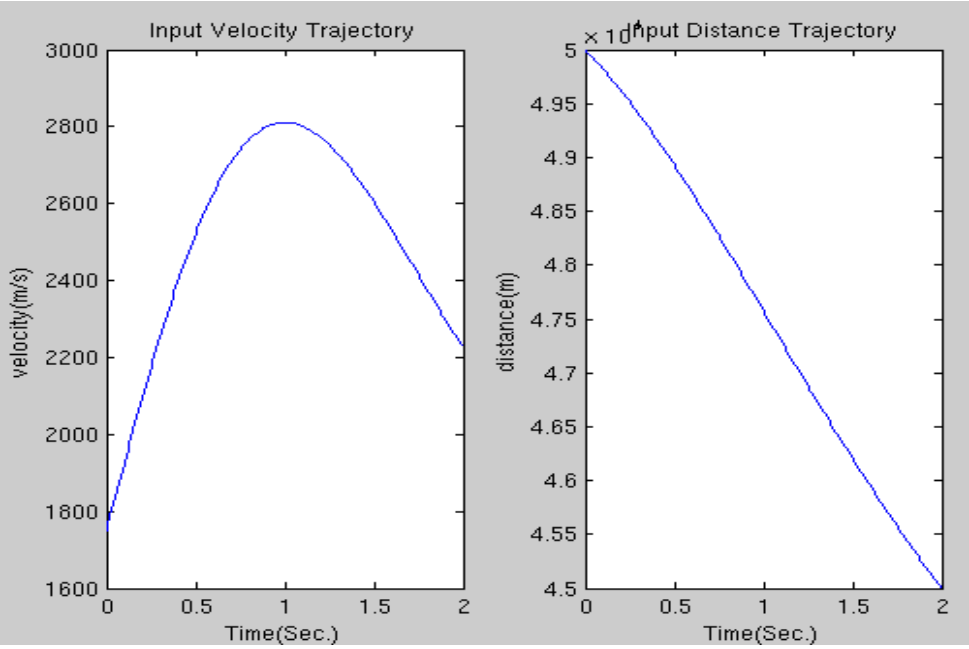

RCS for Scatterers Vs Angle (6-scaterers)
RCS(m2)
Angle in degrees
0
1
2
3
4
5
6
0
10
20
30
40
50
60
70
80
90
100


RCS for Whole Plane Vs Angle (with scatterers)
RCS(m2)
Angle in degrees
0
2
4
6
8
10
12
14
16
18
20
-50
-40
-30
-20
-10
0
10
20
30
40
50

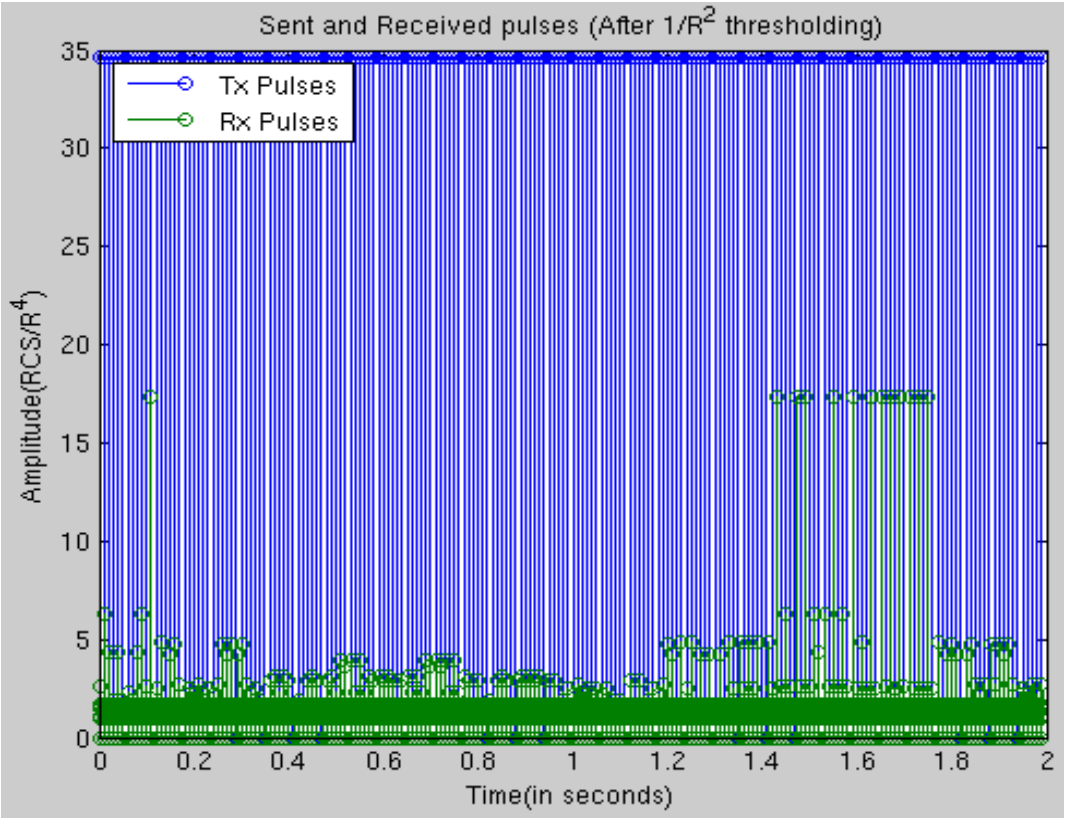

Histogram of RCS of plane (with scaterers)
frequency of occurrence
RCS(m2)
40
35
30
25
20
15
10
5
0
-5
0
5
10
15
20

PART-2 AND PART-3

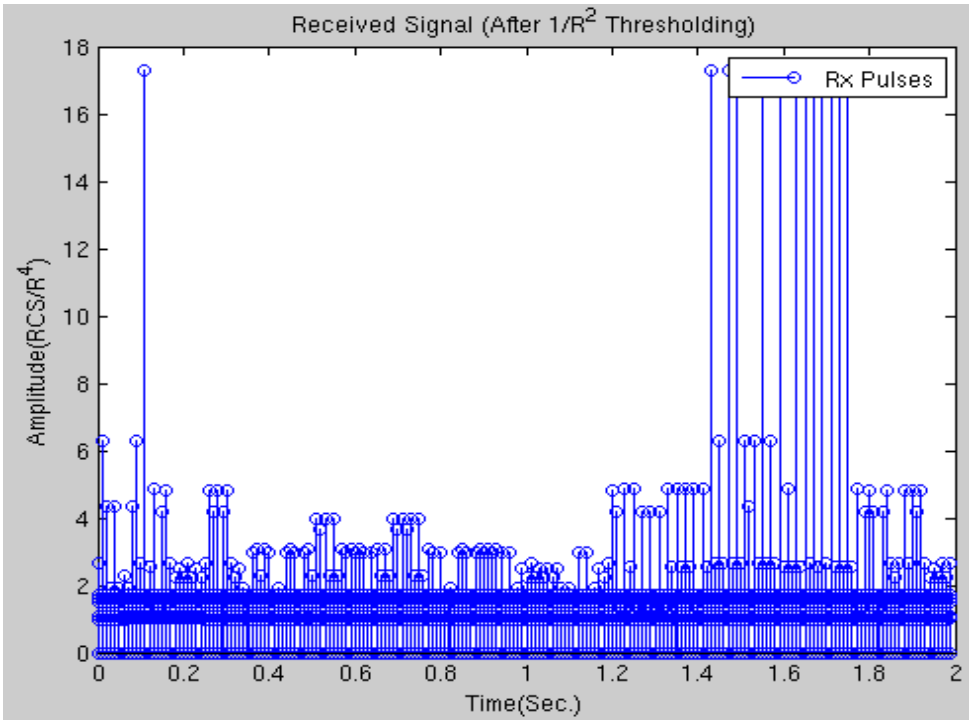
1. Input Trajectory:



2. Sent and Received signal from radar:



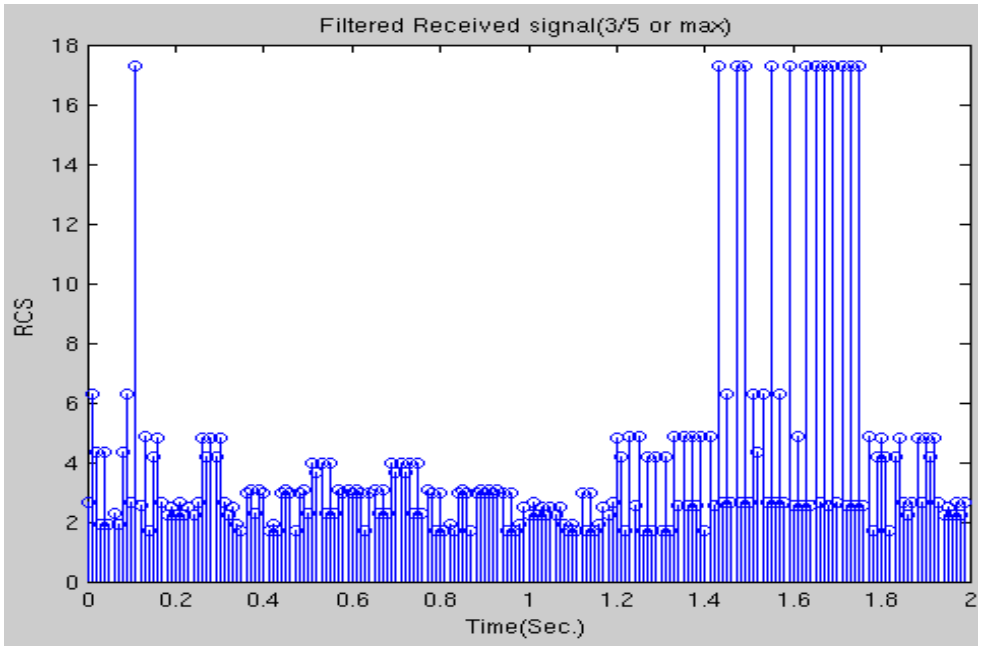
3. Received Pulses after applying (1/R^2) Thresholding



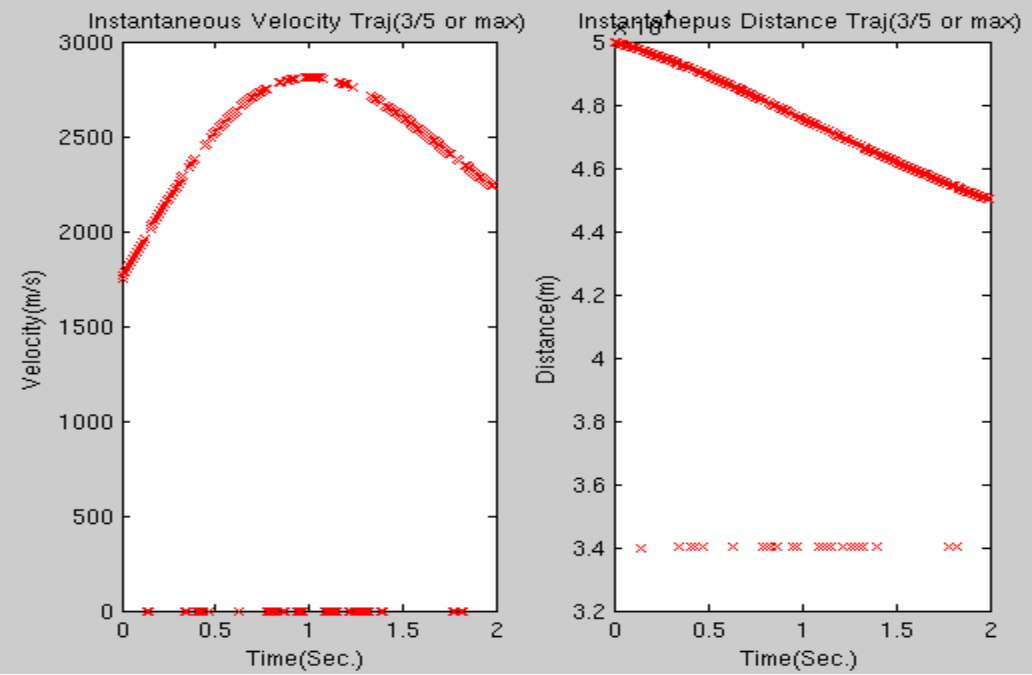
Detection:

1. <u>3/5 Detection or Max Detection:</u>

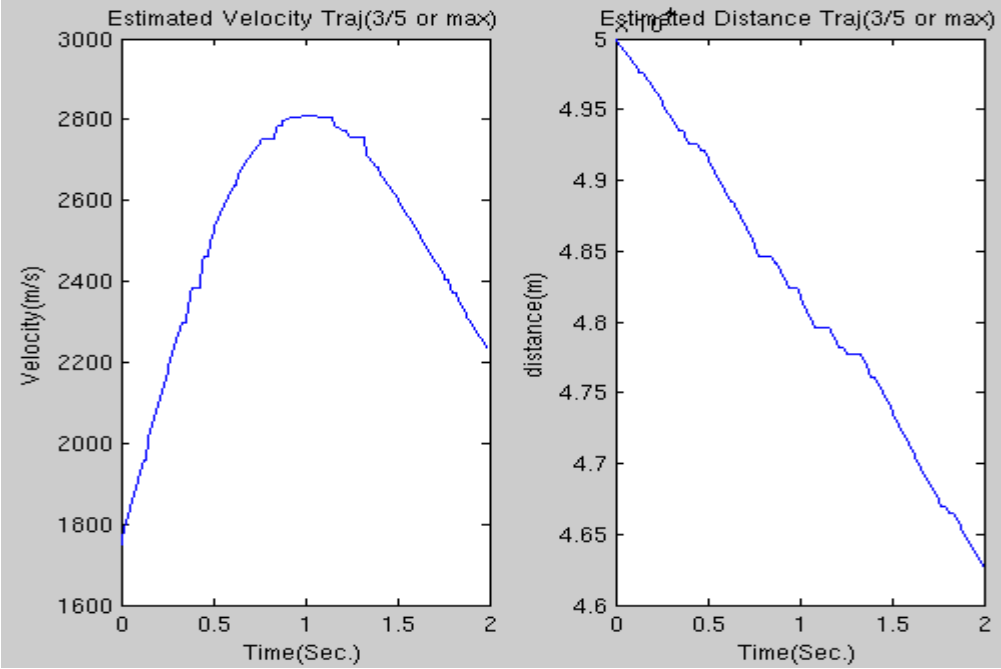
Here we filter the input pulses and look for pulse of maximum amplitude and then apply 3/5 detection scheme.



1. Instantaneous calculation of velocity and distance using Received pulses:



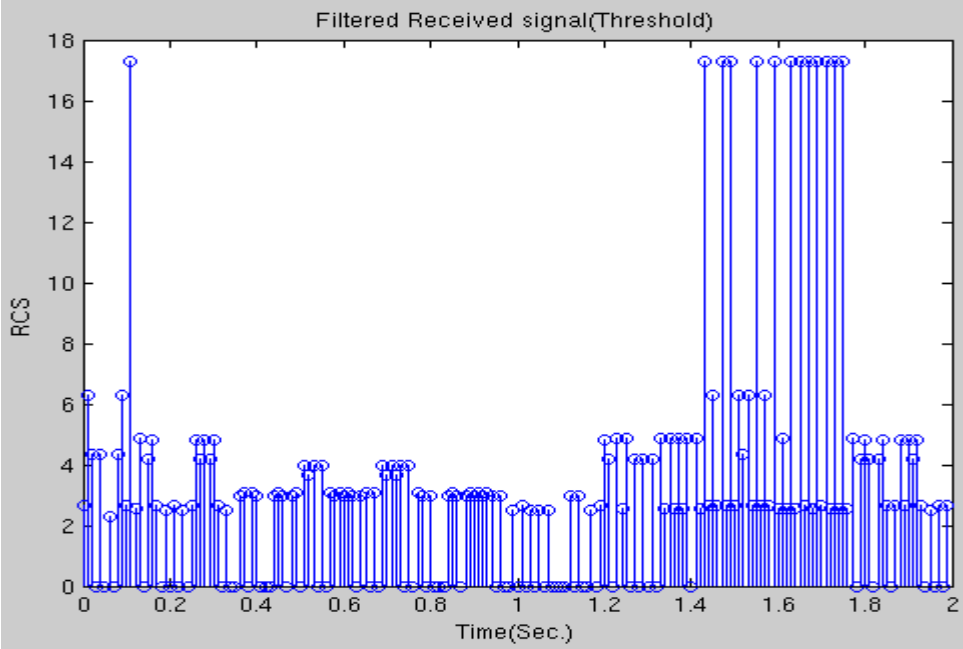
2. Estimated velocity and distance trajectory using 3/5 or max detection scheme:



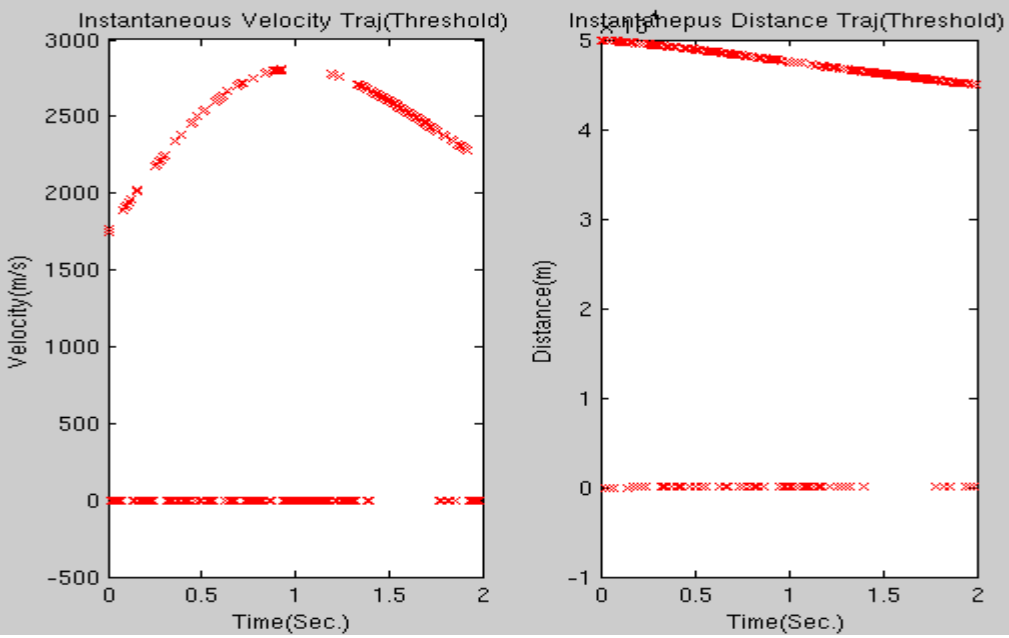
2. Threshold Detection:

Here we are using max(rcs of trees)+0.5 as threshold for detection.

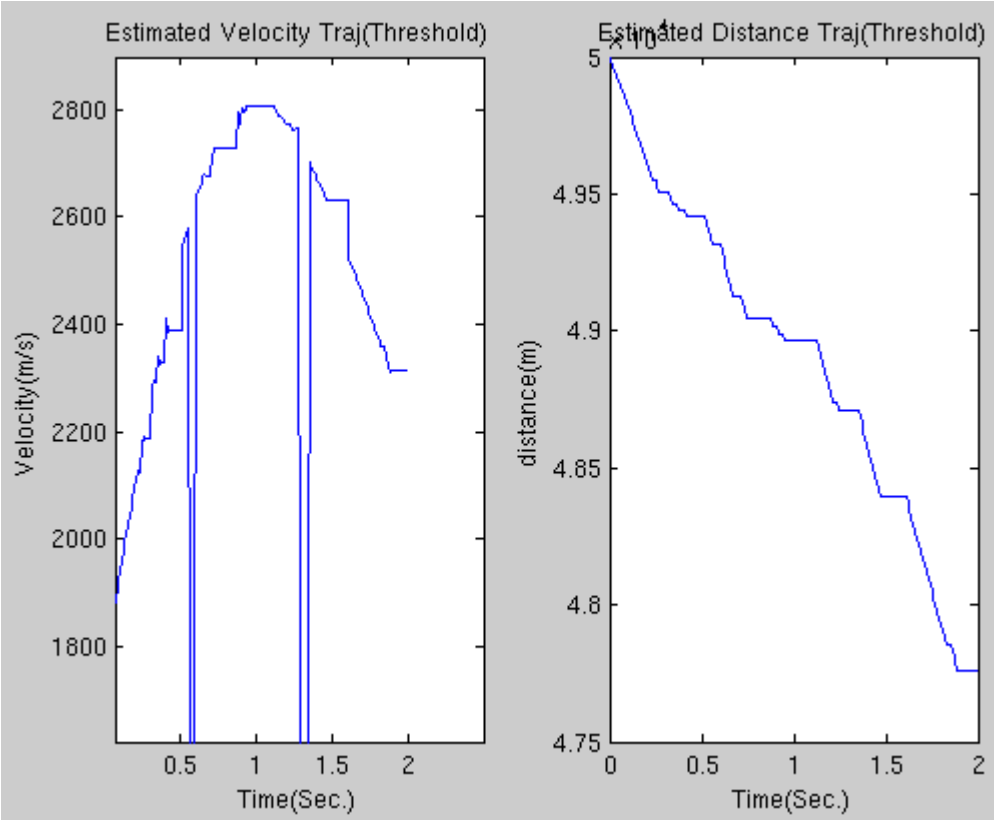
1. Pulses received after applying threshold detection:



2. Instantaneous calculated velocity and distance trajectories:

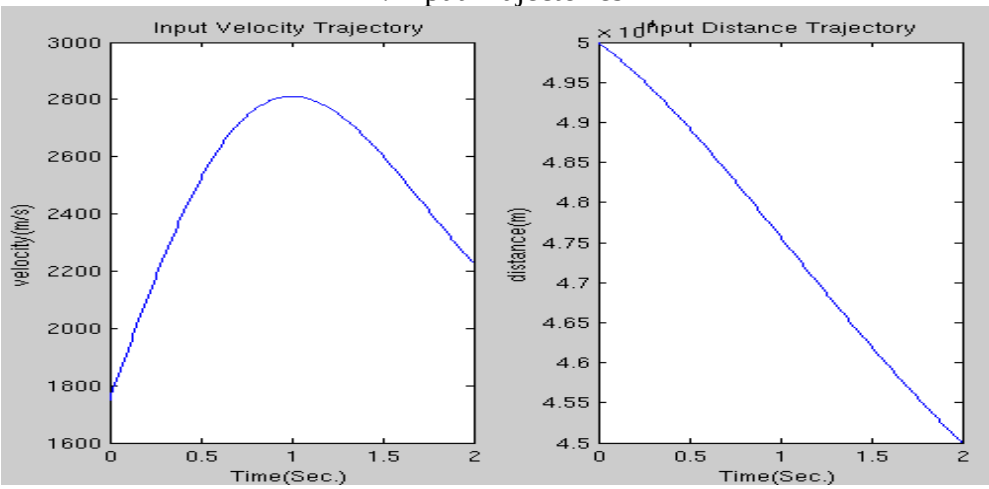


3. Estimated velocity and distance trajectories using threshold detection:

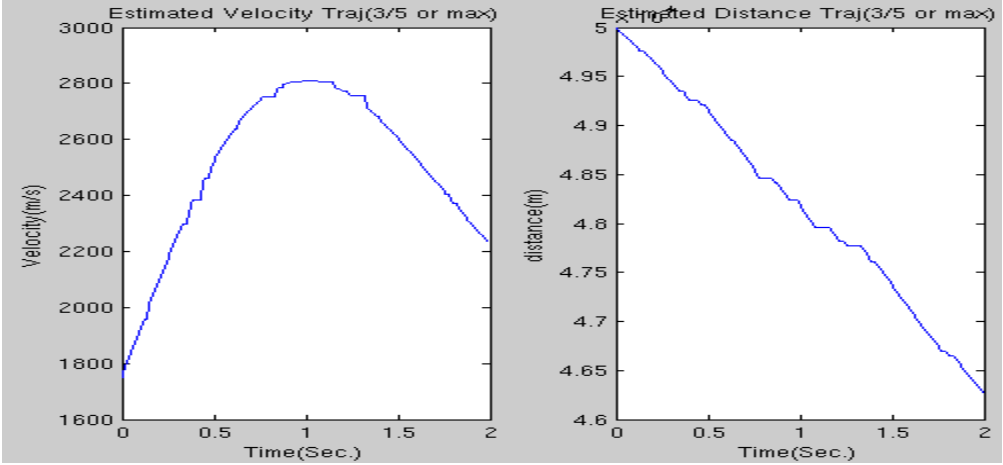


Comparison

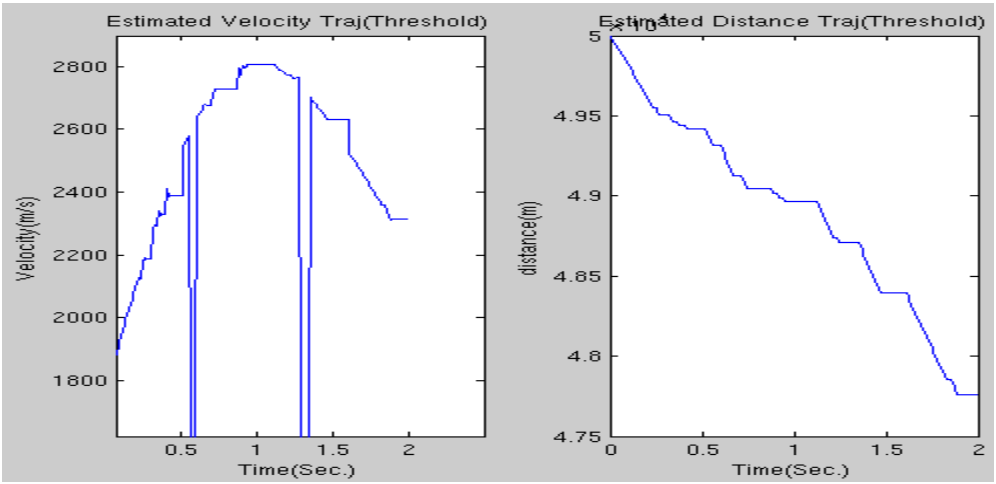
1. Input Trajectories



2. 3/5 or Max detection

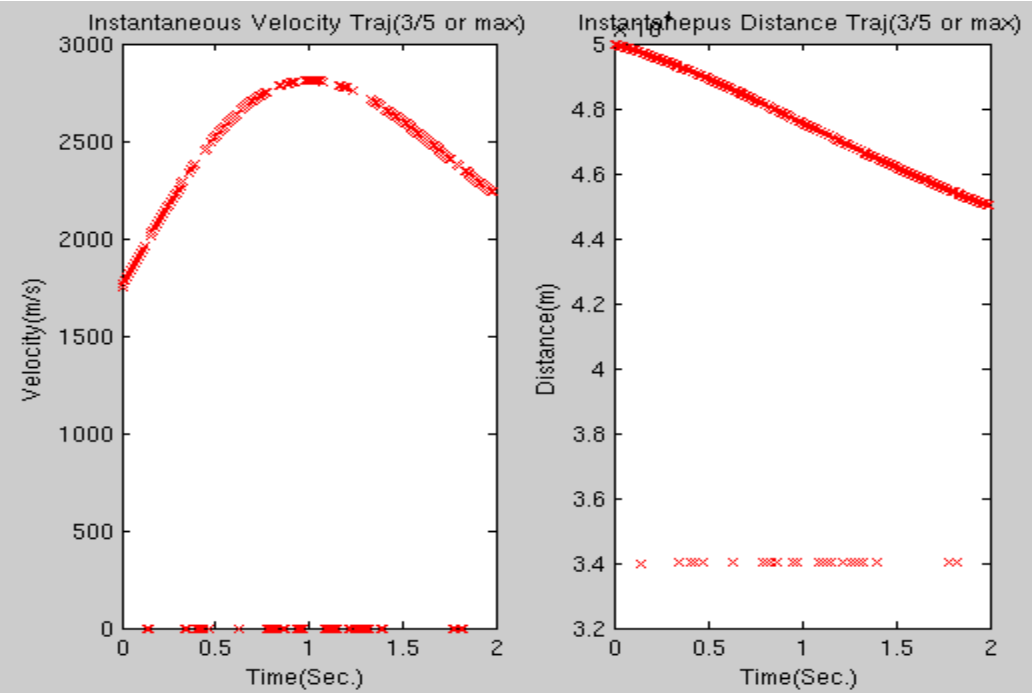


3. Threshold detection



Comparison

1. 3/5 Detection scheme



2. Threshold detection