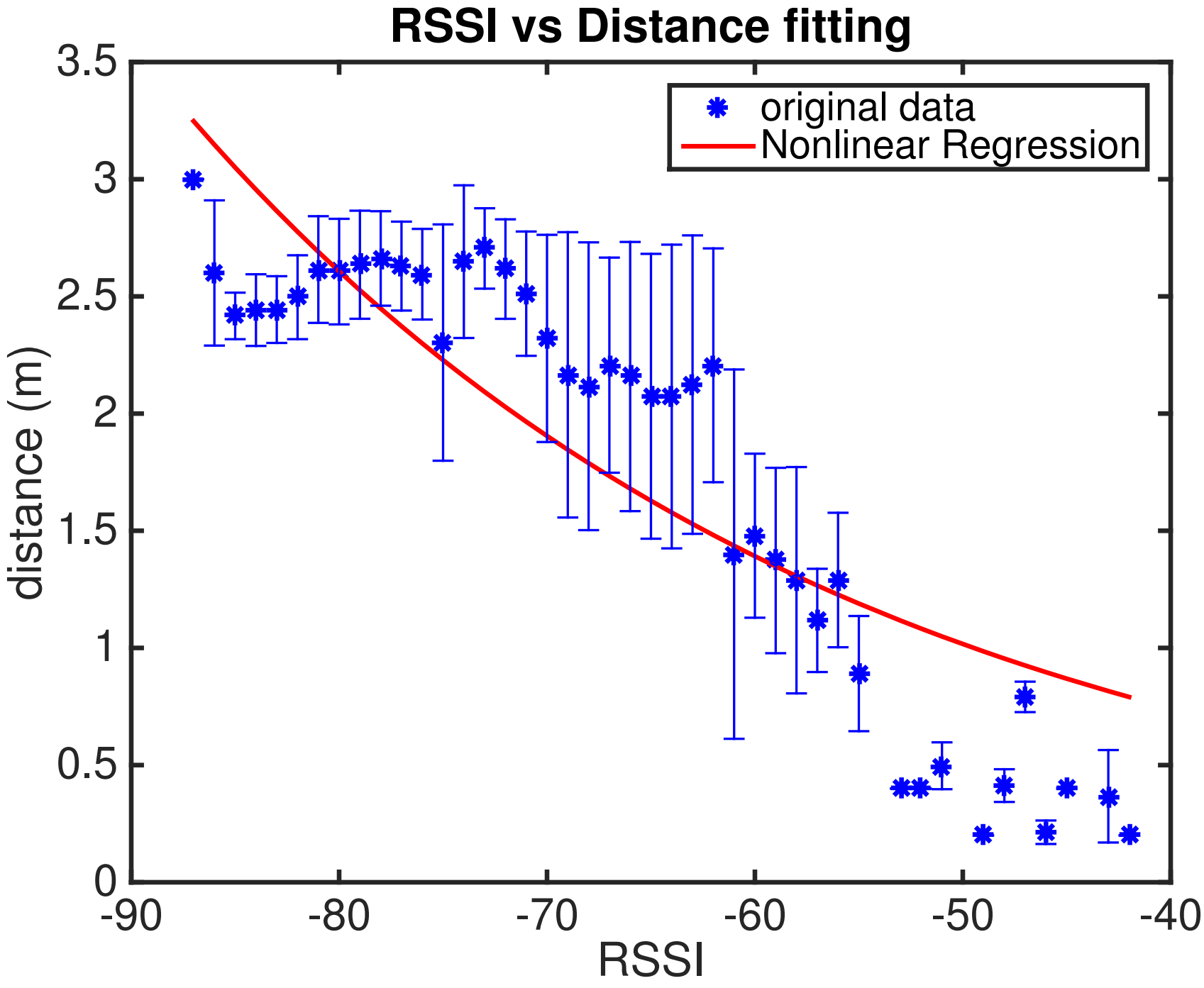
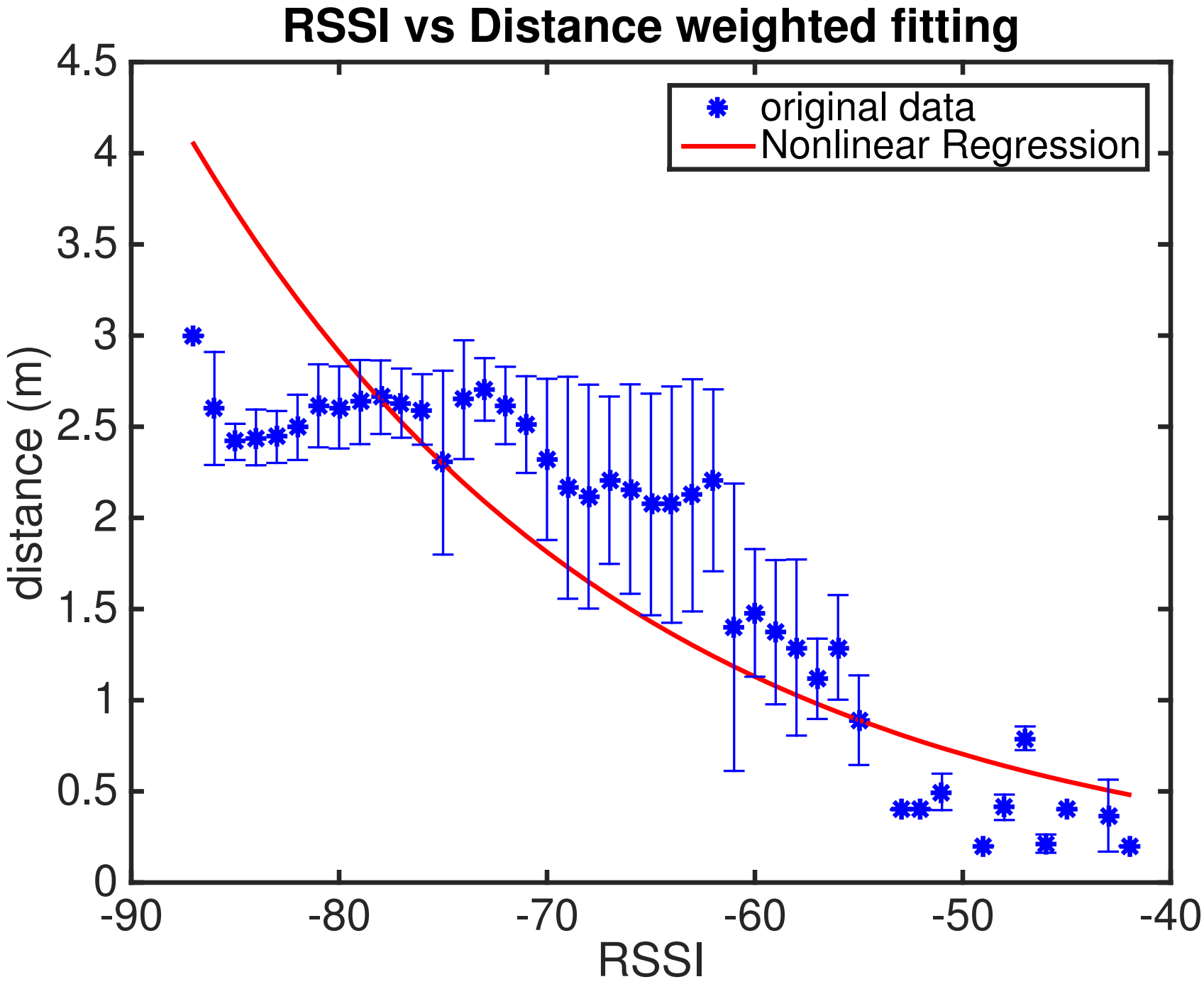
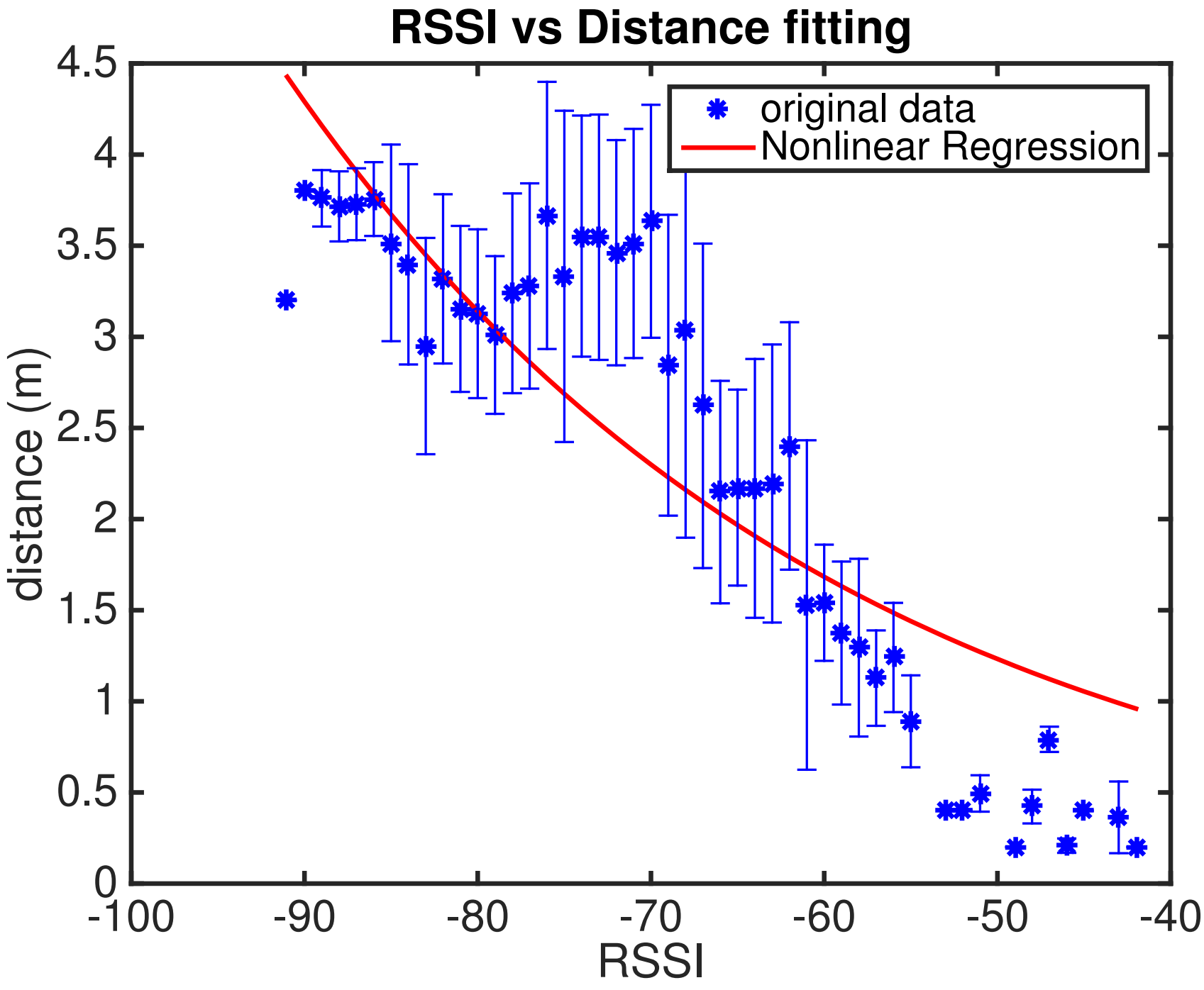
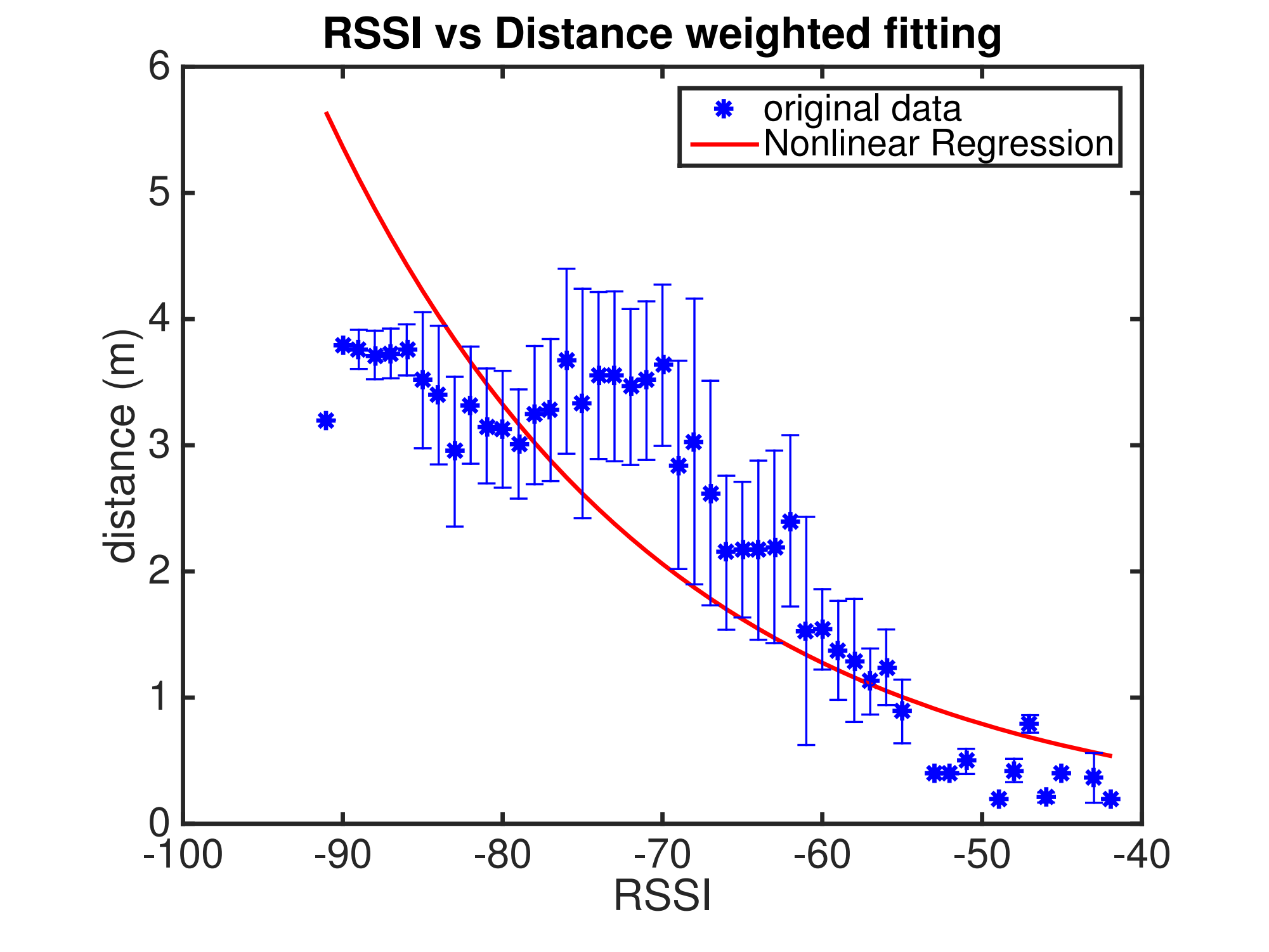

RSSI vs Distance fitting
original data
Nonlinear Regression
distance (m)
RSSI
3.5
3
2.5
2
1.5
1
0.5
0
-90
-80
-70
-60
-50
-40

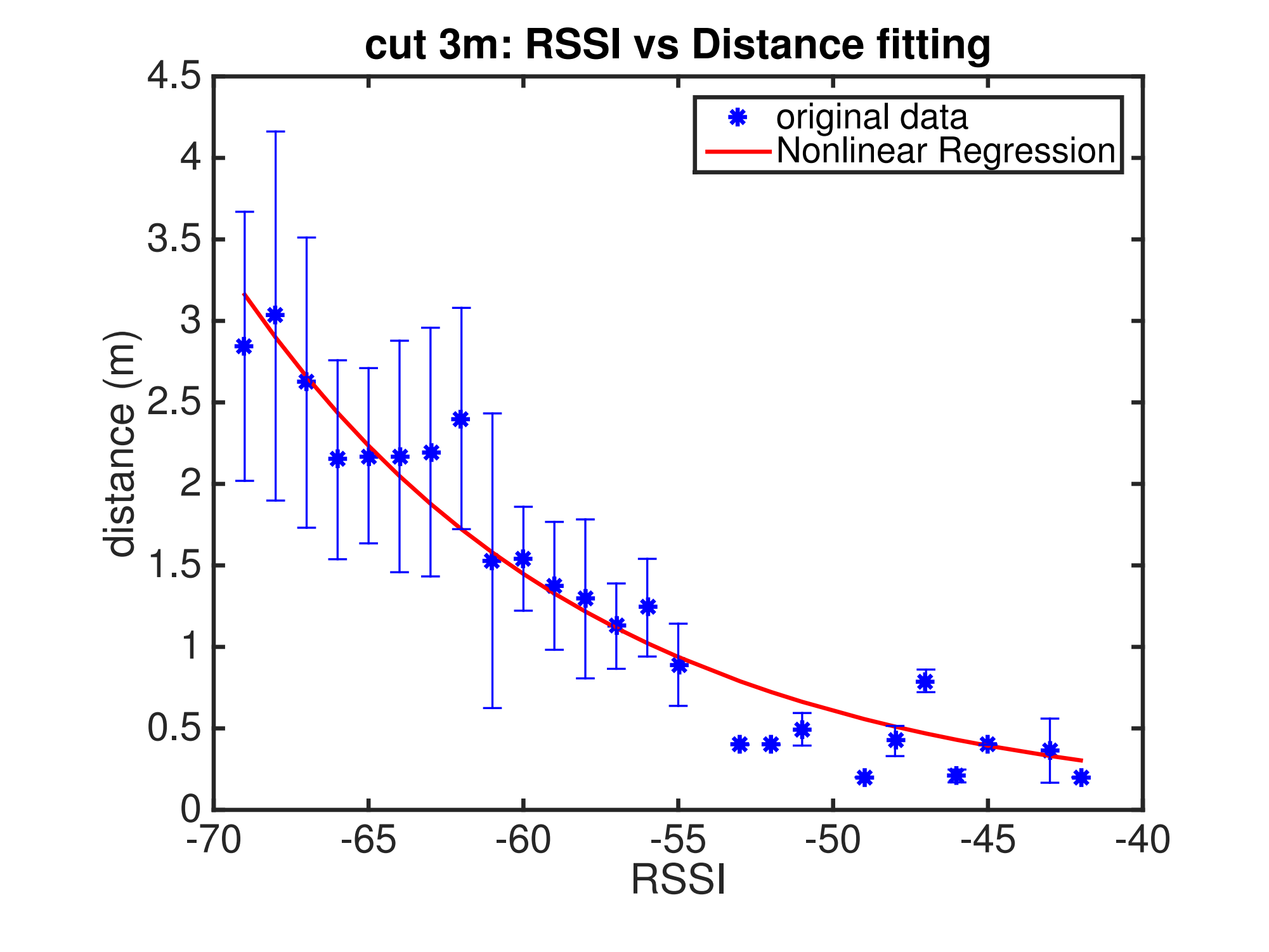

RSSI vs Distance weighted fitting
original data
Nonlinear Regression
distance (m)
RSSI
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-90
-80
-70
-60
-50
-40

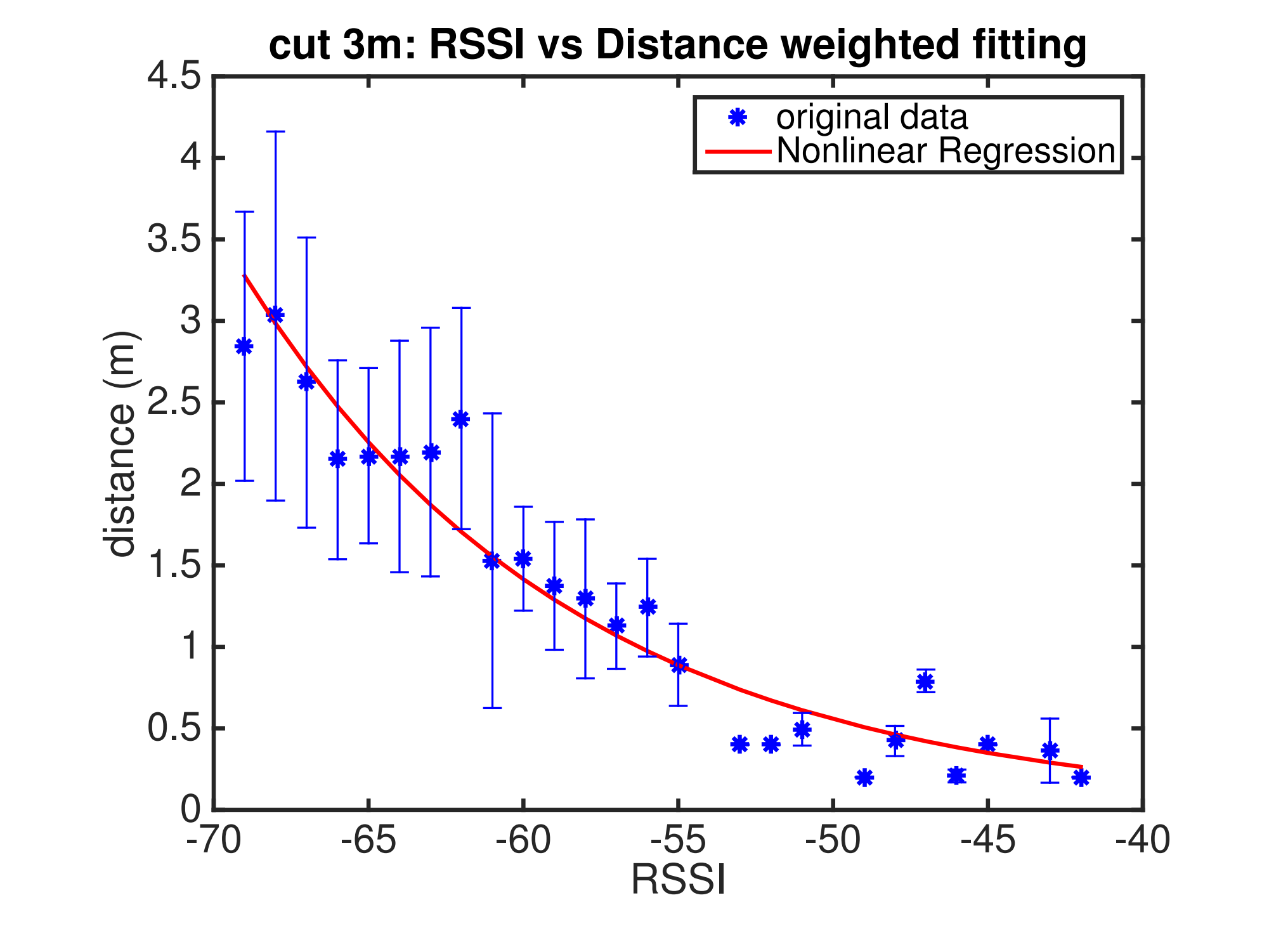
After extend the distance to 4.4m


RSSI vs Distance fitting
original data
Nonlinear Regression
distance (m)
RSSI
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-100
-90
-80
-70
-60
-50
-40

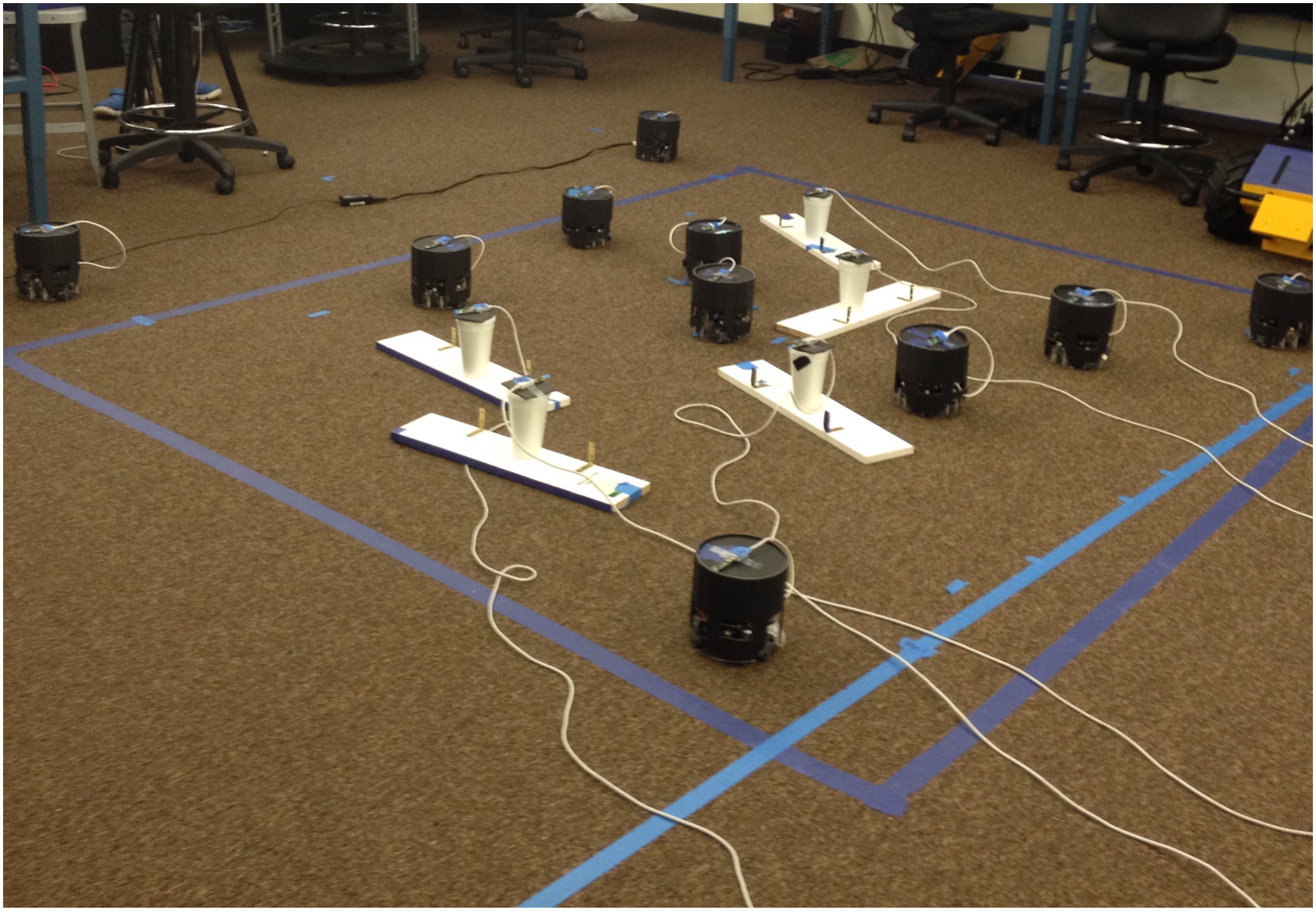

RSSI vs Distance weighted fitting
original data
Nonlinear Regression
distance (m)
RSSI
0
1
2
3
4
5
6
-100
-90
-80
-70
-60
-50
-40

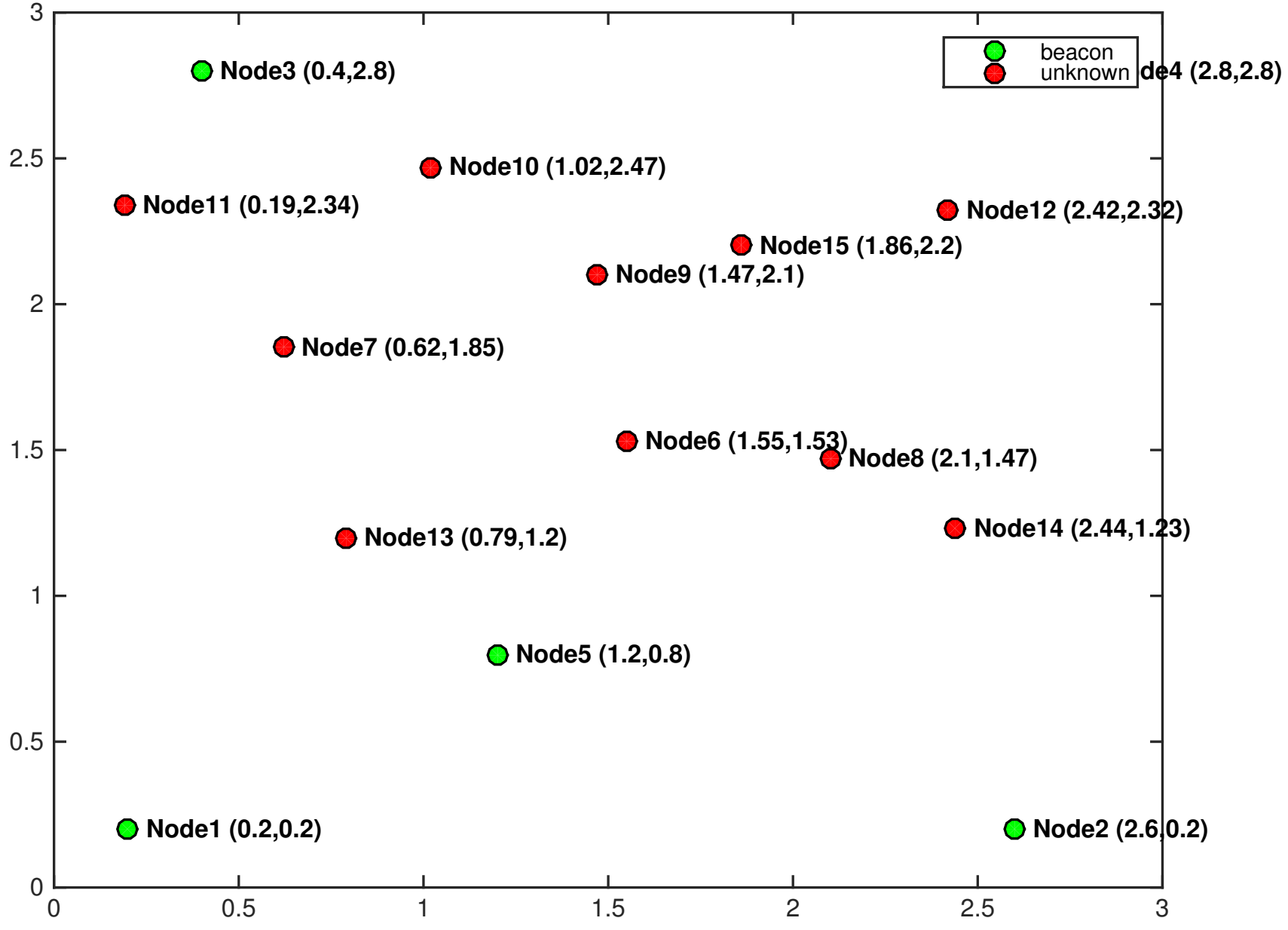
After cutting the mean distance larger than 3m


cut 3m: RSSI vs Distance fitting
original data
Nonlinear Regression
distance (m)
RSSI
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-70
-65
-60
-55
-50
-45
-40


cut 3m: RSSI vs Distance weighted fitting
original data
Nonlinear Regression
distance (m)
RSSI
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-70
-65
-60
-55
-50
-45
-40

- rssi distance direct mapping
- rssi distance fitting
- rssi distance weighted fitting
- cut 3m direct mapping
- cut 3m fitting
- cut 3m weighted fitting




beacon
unknown
Node3 (0.4,2.8)
de4 (2.8,2.8)
Node10 (1.02,2.47)
Node11 (0.19,2.34)
Node12 (2.42,2.32)
Node15 (1.86,2.2)
Node9 (1.47,2.1)
Node7 (0.62,1.85)
Node6 (1.55,1.53)
Node8 (2.1,1.47)
Node13 (0.79,1.2)
Node14 (2.44,1.23)
Node5 (1.2,0.8)
Node1 (0.2,0.2)
Node2 (2.6,0.2)
0
0.5
1
1.5
2
2.5
3

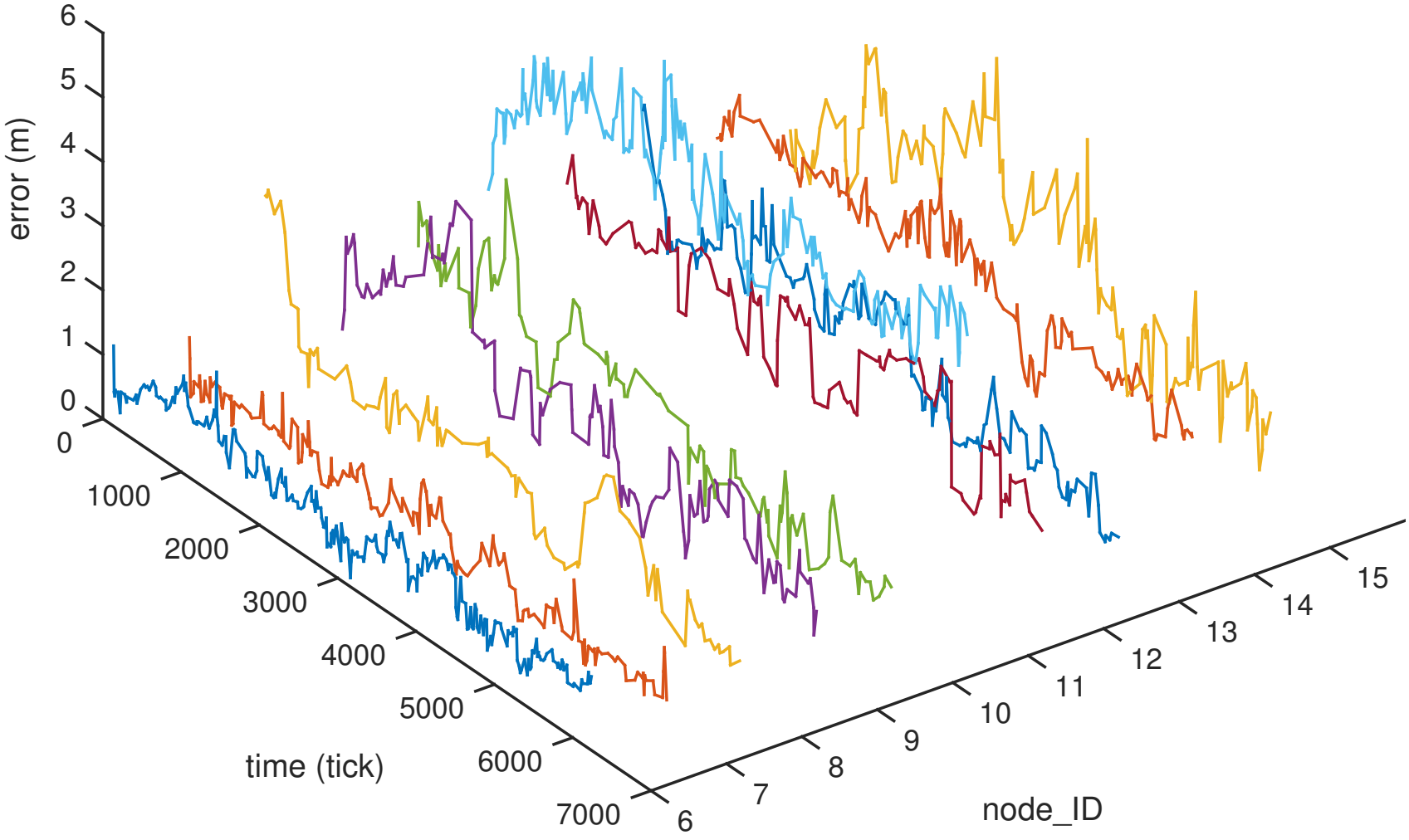
localization errors for kickloc (cut 3m treat outlier as boundary value)

	RSSI to Distance mapping model					
Topology	direct	fitting	weighted fitting	cut 3m direct	cut 3m fitting	cut 3m weighted fitting
1	1.2288	0.5622	0.4823	1.1478	1.1623	1.2600
2	1.2942	1.4003	1.1707	1.3678	1.3309	1.2785
3	1.4390	1.1357	0.9791	1.2043	1.2858	1.3329
4	1.6591	1.3580	1.0879	1.5041	1.4235	1.5219
5	1.4182	1.1367	1.1893	1.2198	1.5674	1.9128
average	1.4079	1.1186	0.9819	1.2887	1.3540	1.4612

localization errors for kickloc (cut 3m treat discard outlier)

	RSSI to Distance mapping model					
Topology	direct	fitting	weighted fitting	cut 3m direct	cut 3m fitting	cut 3m weighted fitting
1	1.2288	0.5622	0.4823	1.1113	1.0564	1.0894
2	1.2942	1.4003	1.1707	0.9697	0.9849	1.0186
3	1.4390	1.1357	0.9791	1.1492	0.9733	1.1656
4	1.6591	1.3580	1.0879	1.4220	1.9286	1.4352
5	1.4182	1.1367	1.1893	1.2885	1.1299	1.6771
average	1.4079	1.1186	0.9819	1.1881	1.2146	1.2772

time evolving result for topo1 method1

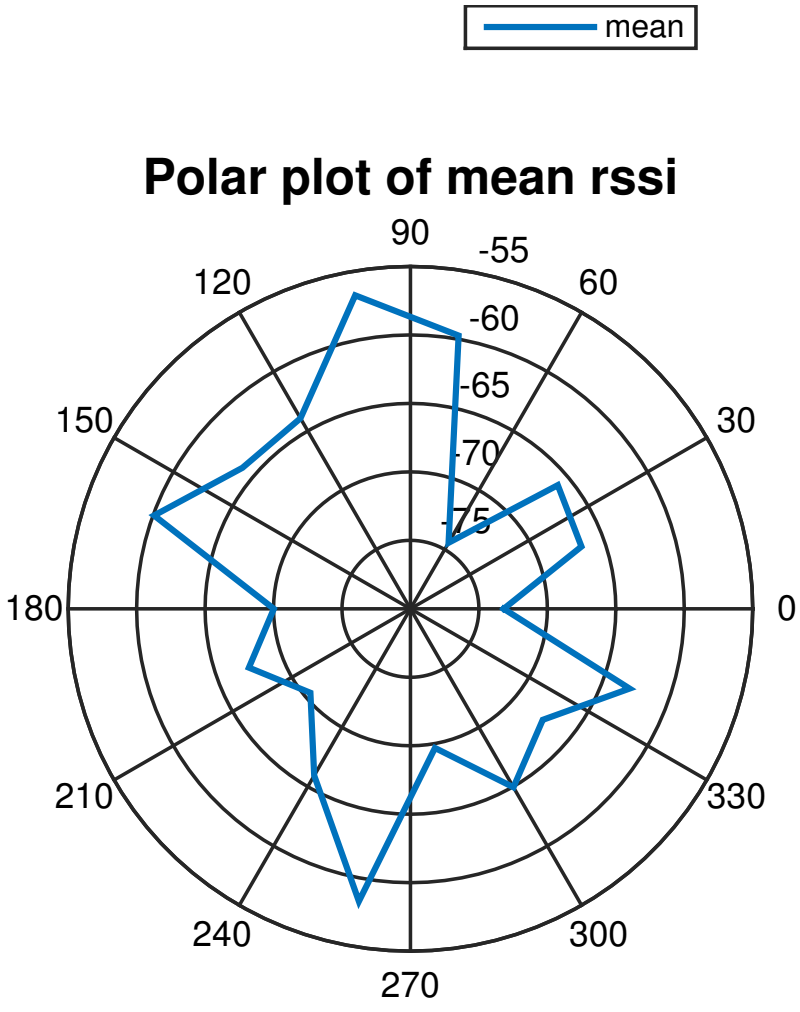


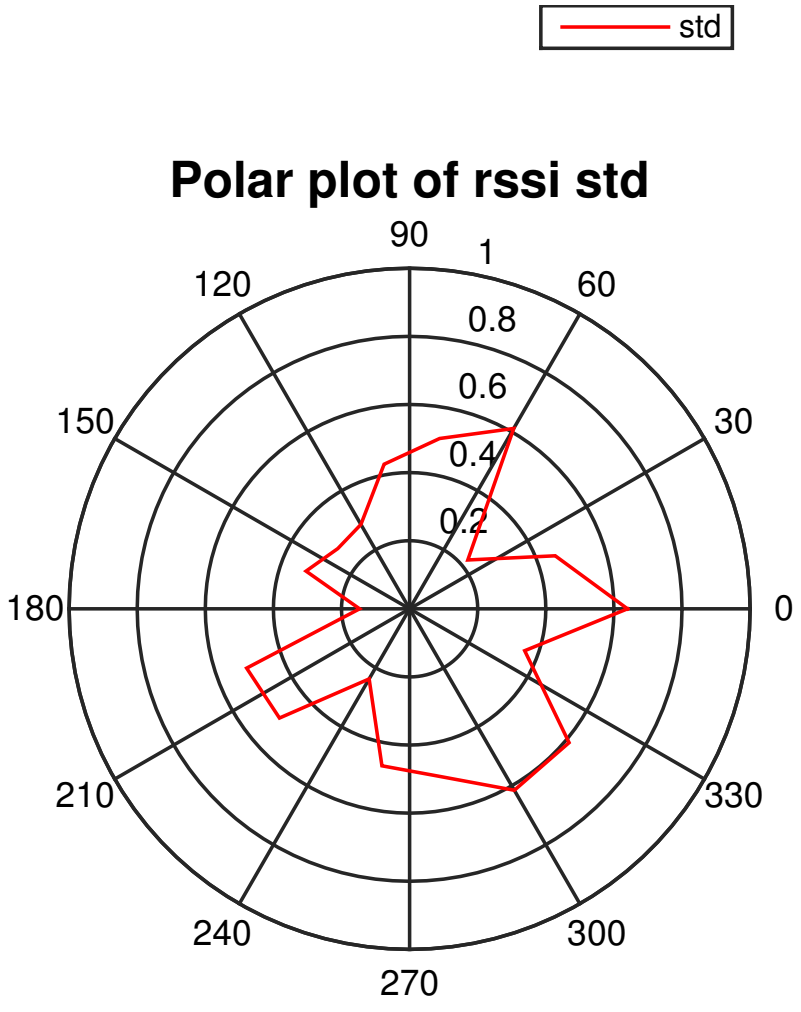
localization errors for kickloc when only leveraging beacon information

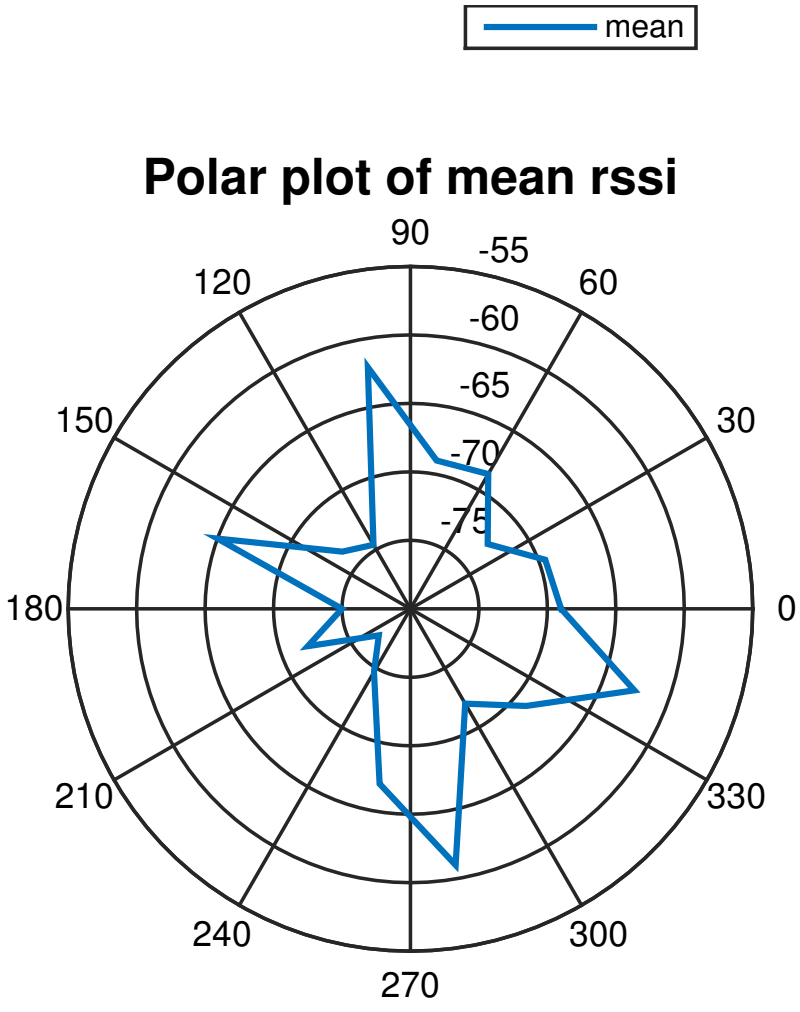
	RSSI to Distance mapping model					
Topology	direct	fitting	weighted fitting	cut 3m direct	cut 3m fitting	cut 3m weighted fitting
1	1.5973	0.7827	0.7846	1.3661	1.4071	1.4873
2	1.1622	0.7455	0.8318	1.0589	1.2185	1.2768
3	1.3424	0.8064	0.8584	0.9084	1.2069	1.2656
4	1.7863	1.2275	1.0972	1.4245	1.6041	1.6898
5	1.6743	0.8378	0.8051	1.2402	1.4551	1.6199
average	1.2190	0.8800	0.8754	1.1996	1.3783	1.4679

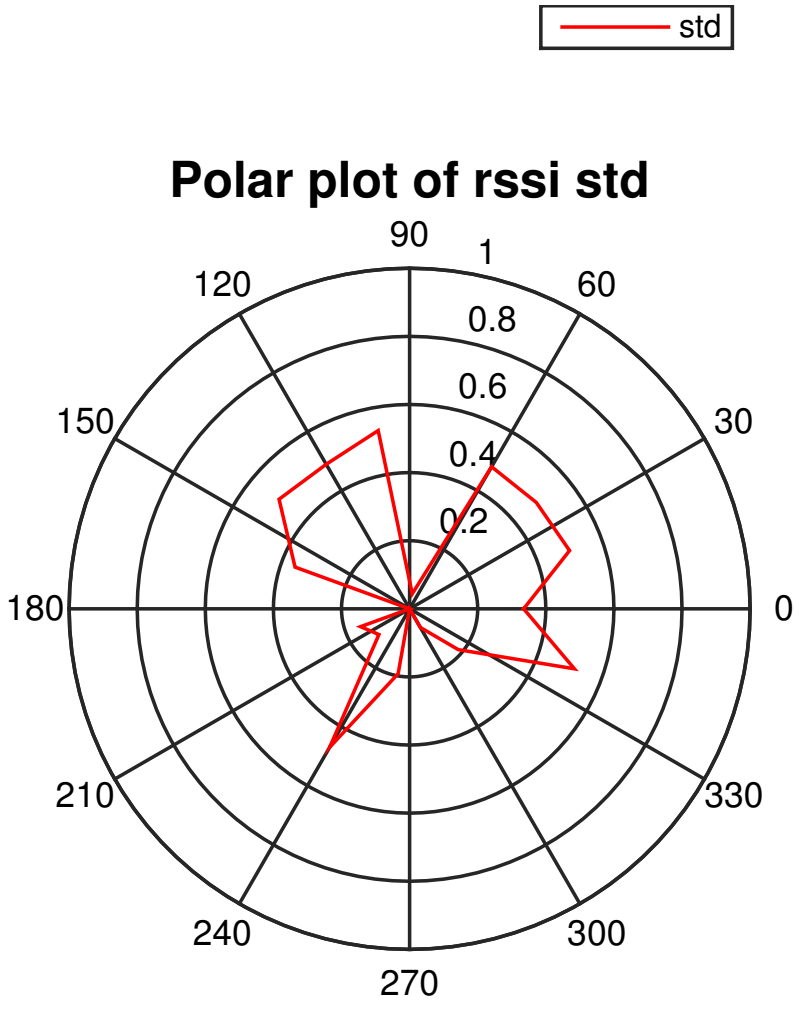
average localization errors for different algorithms

	RSSI to Distance mapping model					
Algorithm	direct	fitting	weighted fitting	cut 3m direct	cut 3m fitting	cut 3m weighted fitting
KickLoc	1.4079	1.1186	0.9819	1.2887	1.3540	1.4612
DV-distance	1.1383	0.7624	0.8661	0.8438	1.0111	1.0975
Min-Max	0.6720	0.6679	0.6615	0.6543	0.6817	0.6975
N-hop Lateration	1.2285	0.9009	1.2003	1.0120	1.1691	1.2712


mean
Polar plot of mean rssi
90
120
60
150
30
180
0
210
330
240
300
270
-55
-60
-65
-70
-75


std
Polar plot of rssi std
90
120
60
150
30
180
0
210
330
240
300
270
1
0.8
0.6
0.4
0.2


mean
Polar plot of mean rssi
90
-55
120
60
-60
-65
150
30
-70
-75
180
0
210
330
240
300
270


std
Polar plot of rssi std
90
1
120
60
0.8
0.6
150
30
0.4
0.2
180
0
210
330
240
300
270