Calibration results
==========
Normalized Residuals

Reprojection error (cam0):   mean 0.28514147122, median 0.281192652925, std: 0.131443277775
Gyroscope error (imu0):   mean 0.152067876258, median 0.136575528272, std: 0.128023595054
Accelerometer error (imu0):   mean 0.185914288828, median 0.117918841216, std: 0.611170779249

Residuals

Reprojection error (cam0) [px]:   mean 0.28514147122, median 0.281192652925, std: 0.131443277775
Gyroscope error (imu0) [rad/s]:   mean 0.00207715406811, median 0.00186553808165, std: 0.00174872391082
Accelerometer error (imu0) [m/s^2]: mean 0.0278018034324, median 0.017633698115, std: 0.091395072296

Transformation (cam0):

T_ci: (imu0 to cam0):
[[0.00540279 -0.99995476 -0.00782916 -0.01113261]
[0.01180902 0.00789253 -0.99989912 0.15064624]
[0.99991567 0.00530979 0.01185113 -0.3156285]
[0.   0.   0.   1.   ]]

T_ic: (cam0 to imu0):
[[0.00540279 0.01180902 0.99991567 0.31388305]
[-0.99995476 0.00789253 0.00530979 -0.01064516]
[-0.00782916 -0.99989912 0.01185113 0.15428443]
[0.   0.   0.   1.   ]]

timeshift cam0 to imu0: [s] (t_imu = t_cam + shift)
0.00212724429675

Gravity vector in target coords: [m/s^2]
[0.04425366 -9.80635603 0.04296344]

Calibration configuration
==========

cam0

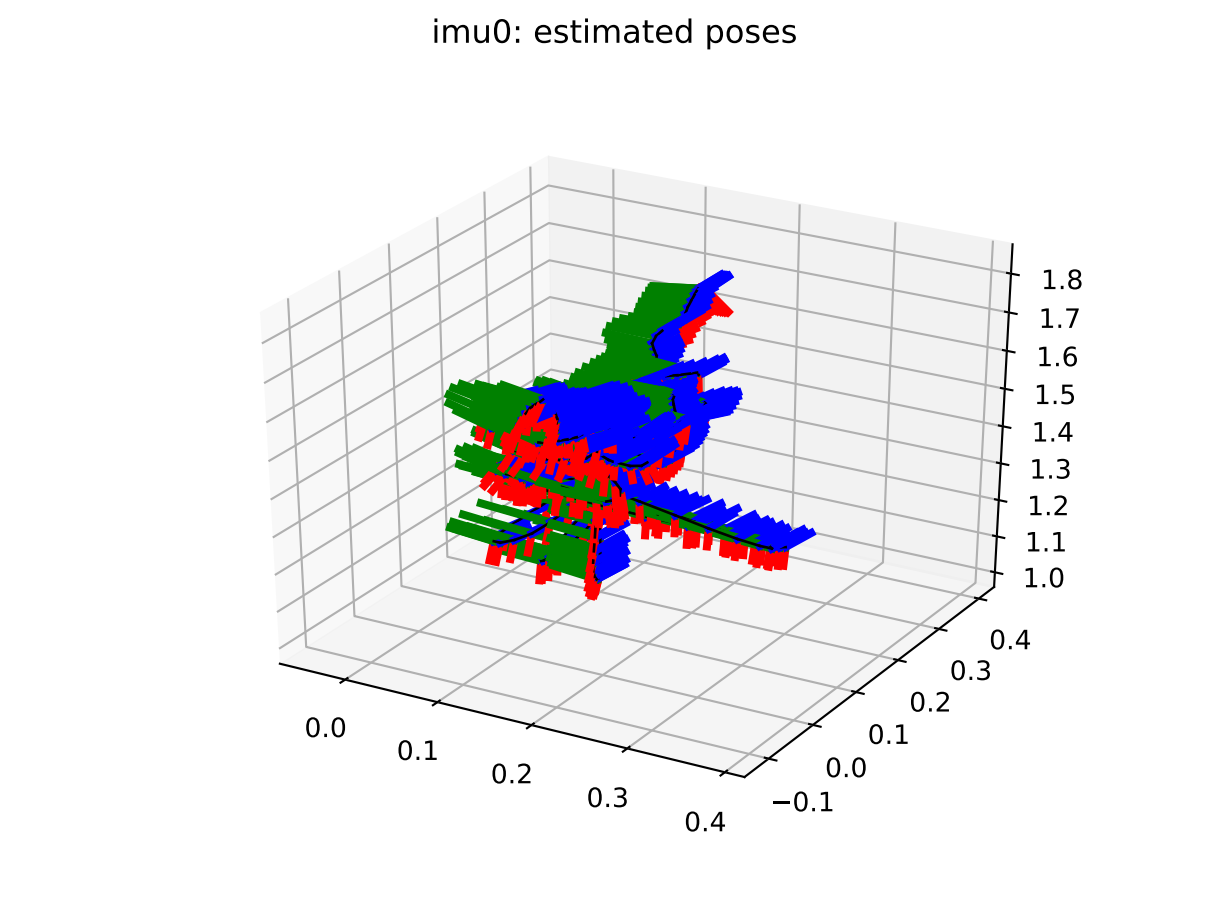
Camera model: pinhole
Focal length: [637.0102235086177, 636.5671950687336]
Principal point: [653.6378859316724, 362.8854879948024]
Distortion model: radtan
Distortion coefficients: [-0.044682744054906895, 0.024952434249305173, -6.46507710571878e-05, 0.0010051644721035 23]
Type: aprilgrid
Tags:
Rows: 6
Cols: 6
Size: 0.0352 [m]
Spacing 0.01056 [m]

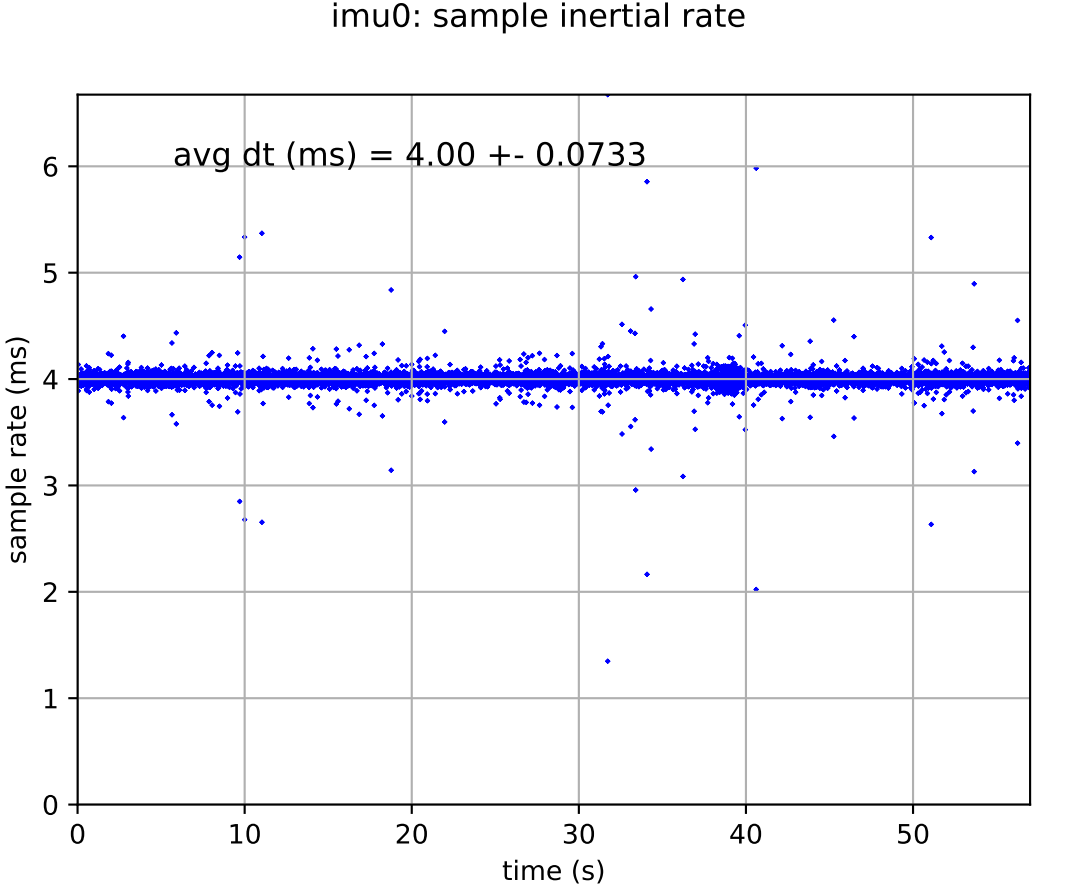
IMU configuration
==========

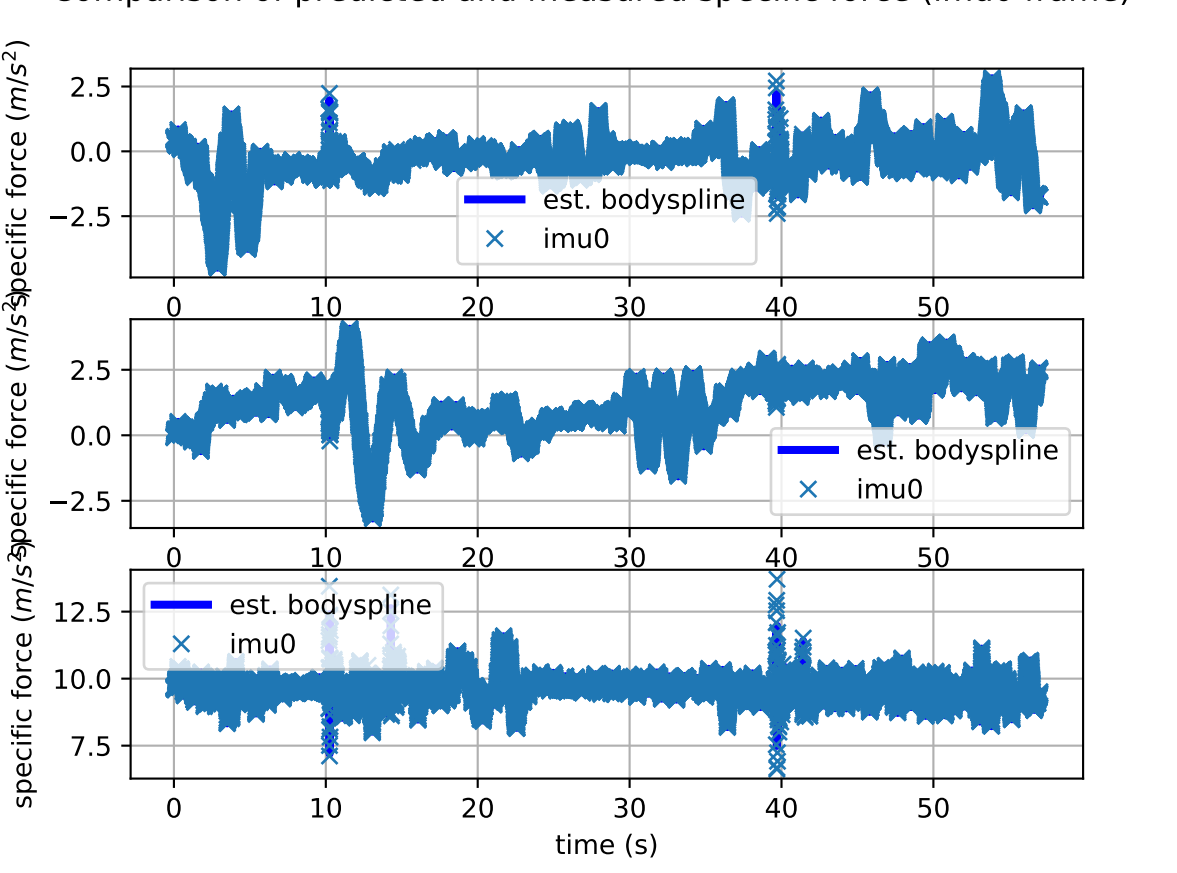
IMU0:

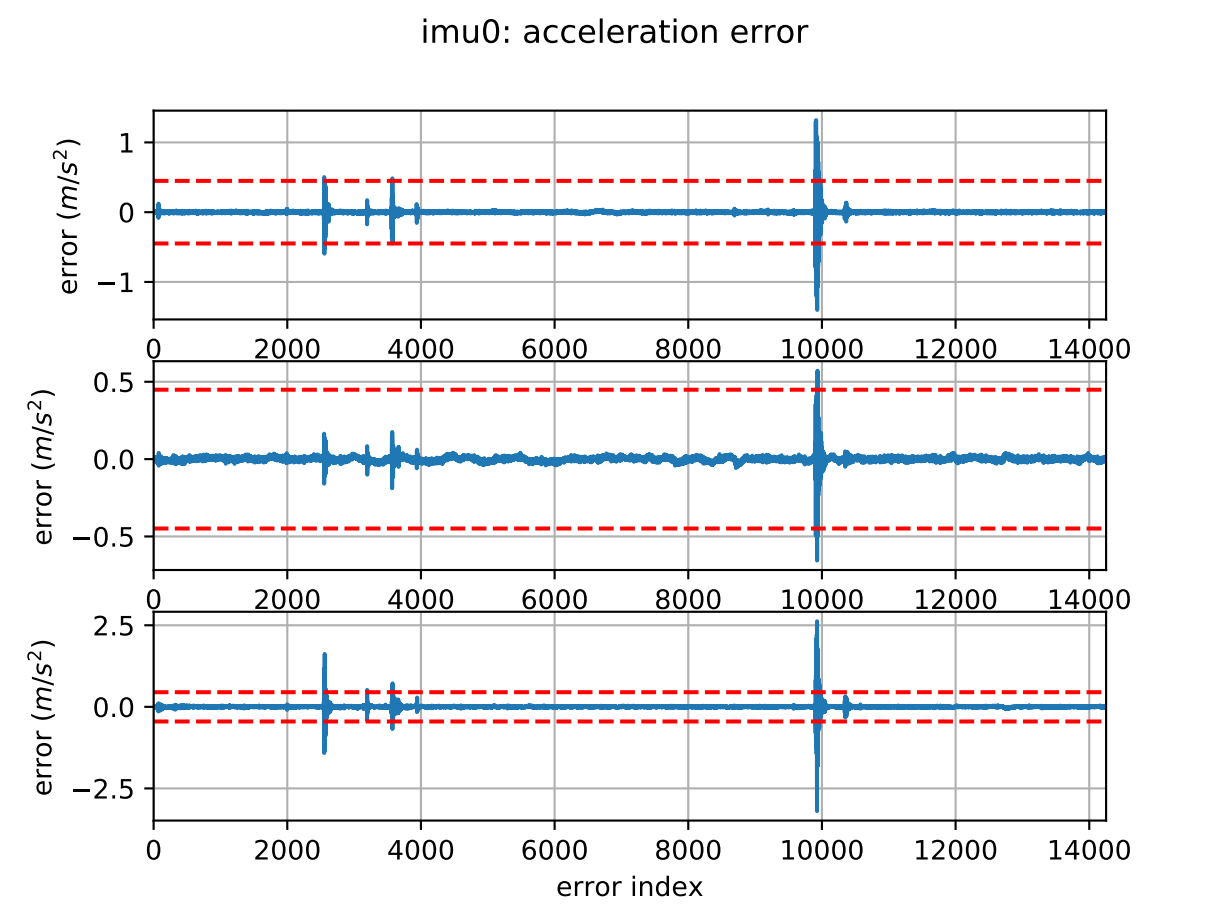
Model: calibrated
Update rate: 250.0
Accelerometer:
Noise density: 0.0094578014913
Noise density (discrete): 0.149540971851
Random walk: 9.53501438591e-05
Gyroscope:
Noise density: 0.000863895527177
Noise density (discrete): 0.0136593876316
Random walk: 3.89832340104e-06

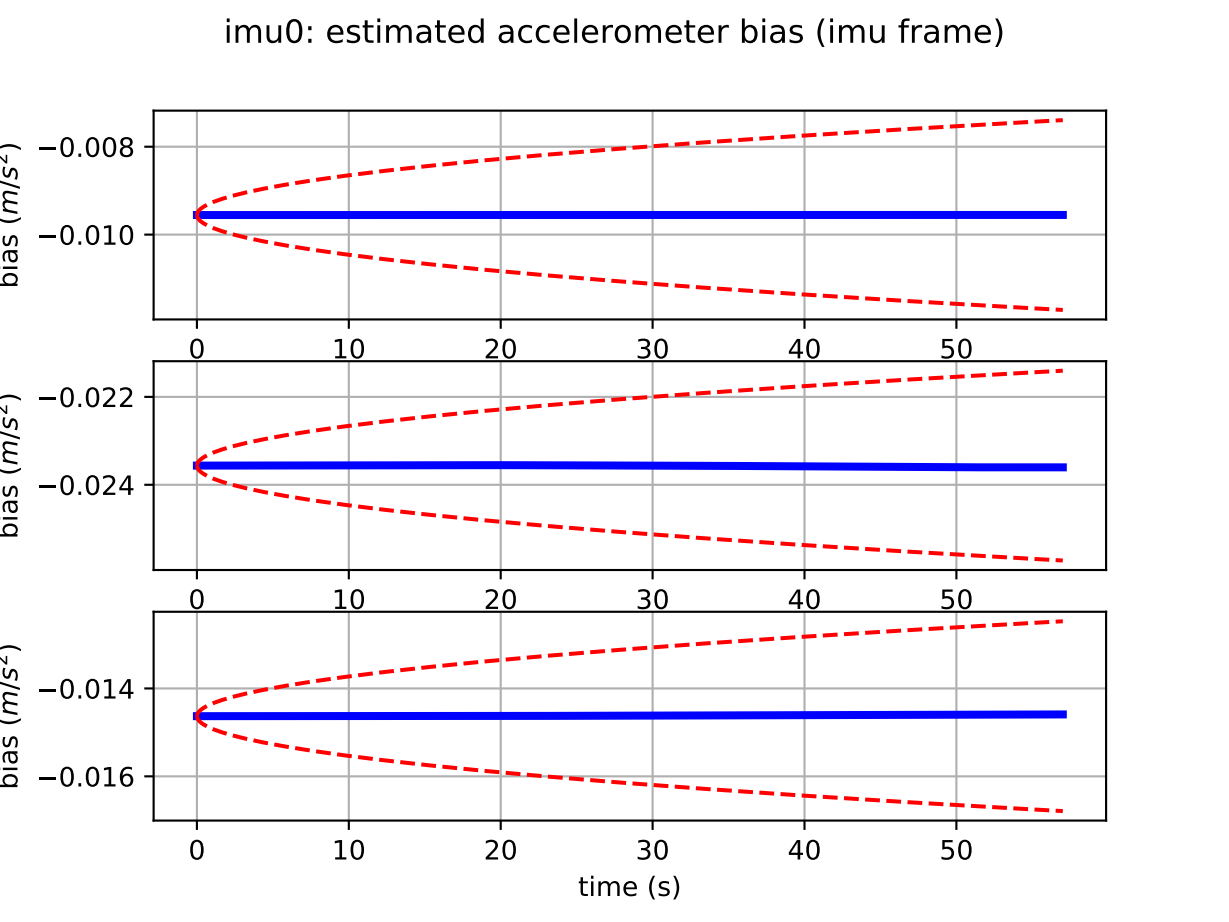
T_ib (imu0 to imu0)
[[1. 0. 0. 0.]
[0. 1. 0. 0.]
[0. 0. 1. 0.]
[0. 0. 0. 1.]]
time offset with respect to IMU0: 0.0 [s]

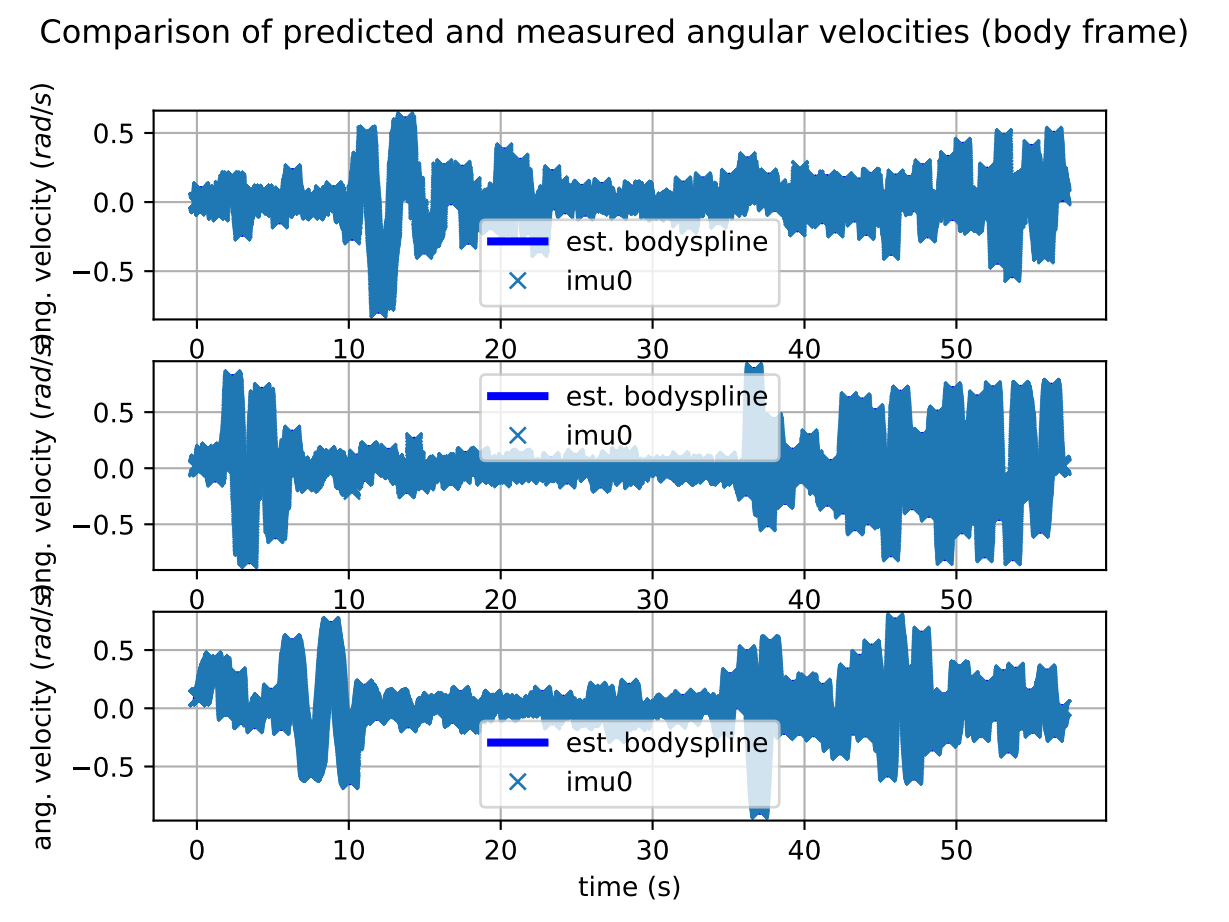

imu0: estimated poses
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.4
0.3
0.2
0.1
0.0
−0.1
0.0
0.1
0.2
0.3
0.4

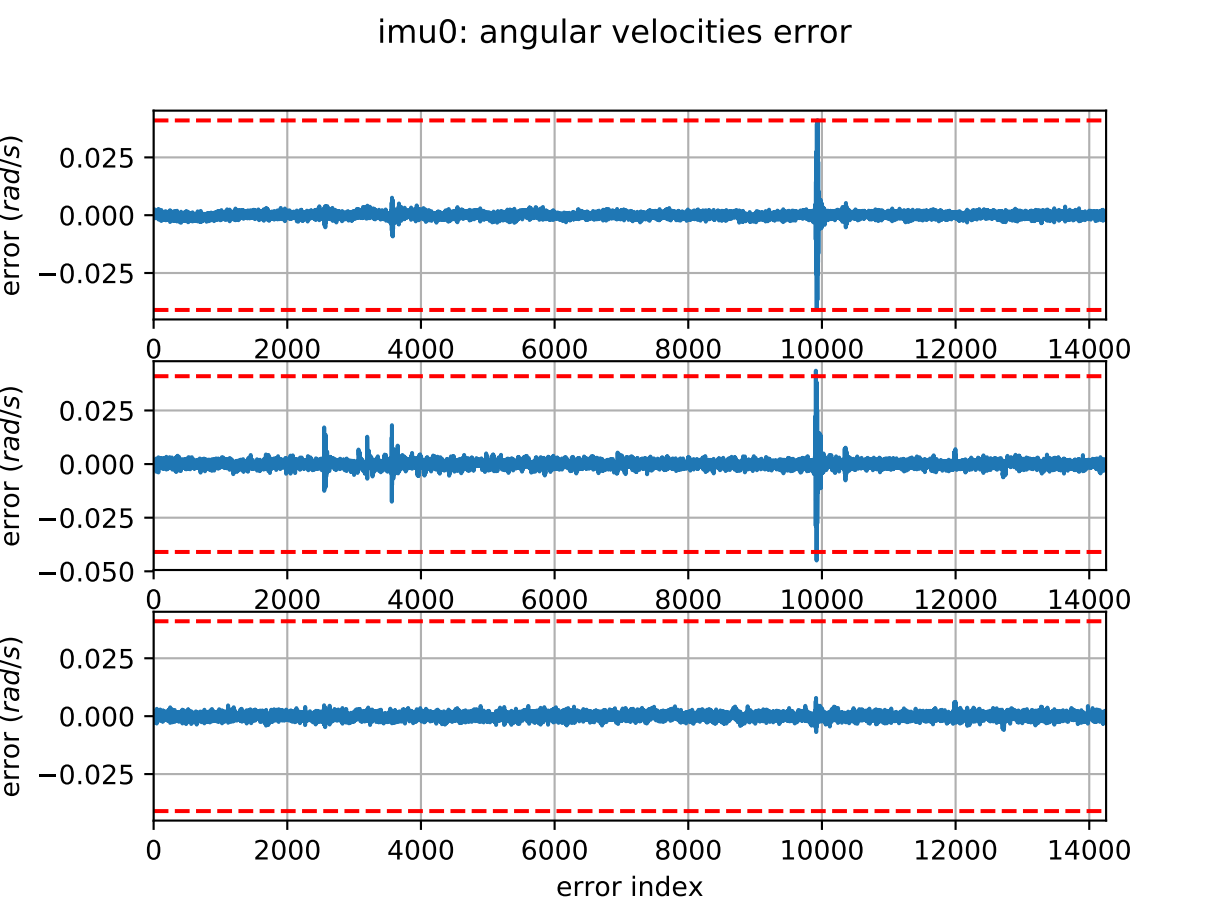

imu0: sample inertial rate
avg dt (ms) = 4.00 +- 0.0733
sample rate (ms)
time (s)
0
1
2
3
4
5
6
0
10
20
30
40
50

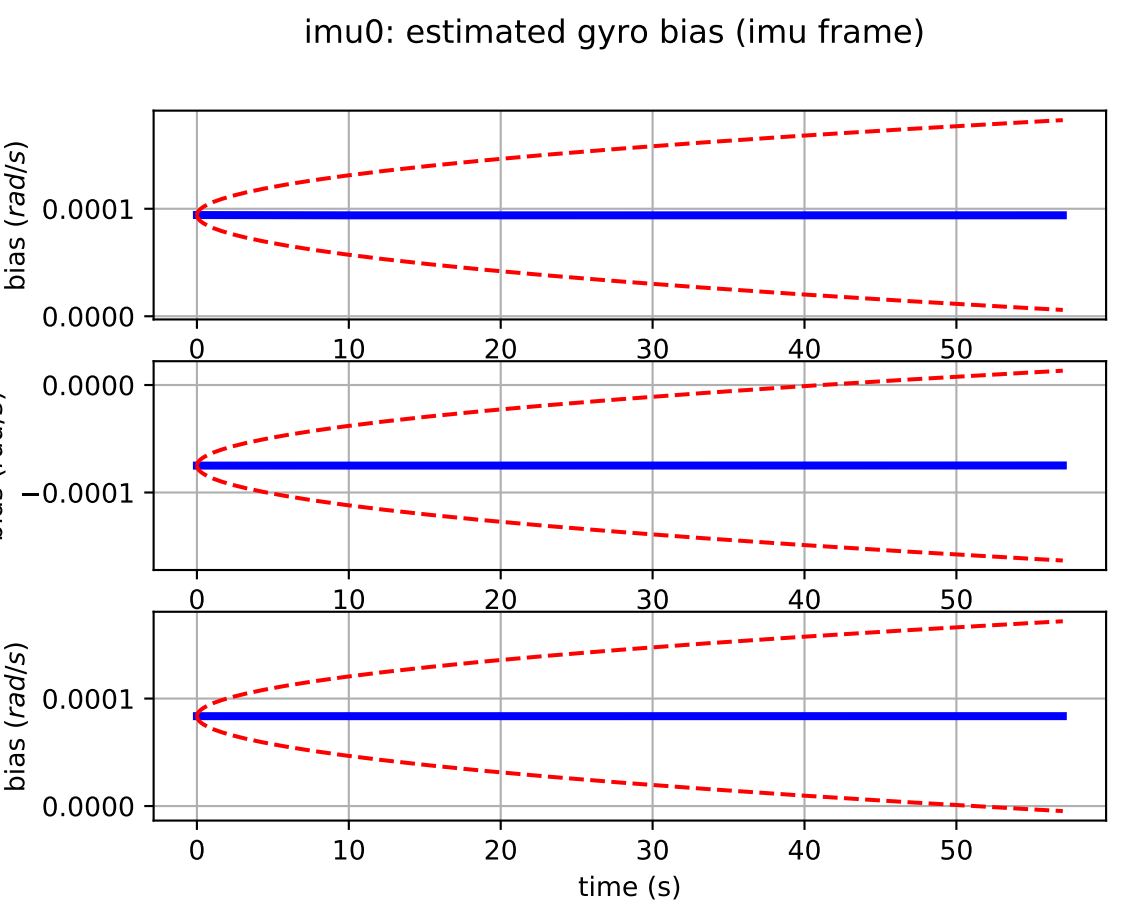

Comparison of predicted and measured specific force (imu0 frame)
specific force (m/s^2)
specific force (m/s^2)
specific force (m/s^2)
est. bodyspline
imu0
est. bodyspline
imu0
est. bodyspline
imu0
2.5
0.0
−2.5
2.5
0.0
−2.5
12.5
10.0
7.5
0
10
20
30
40
50
time (s)

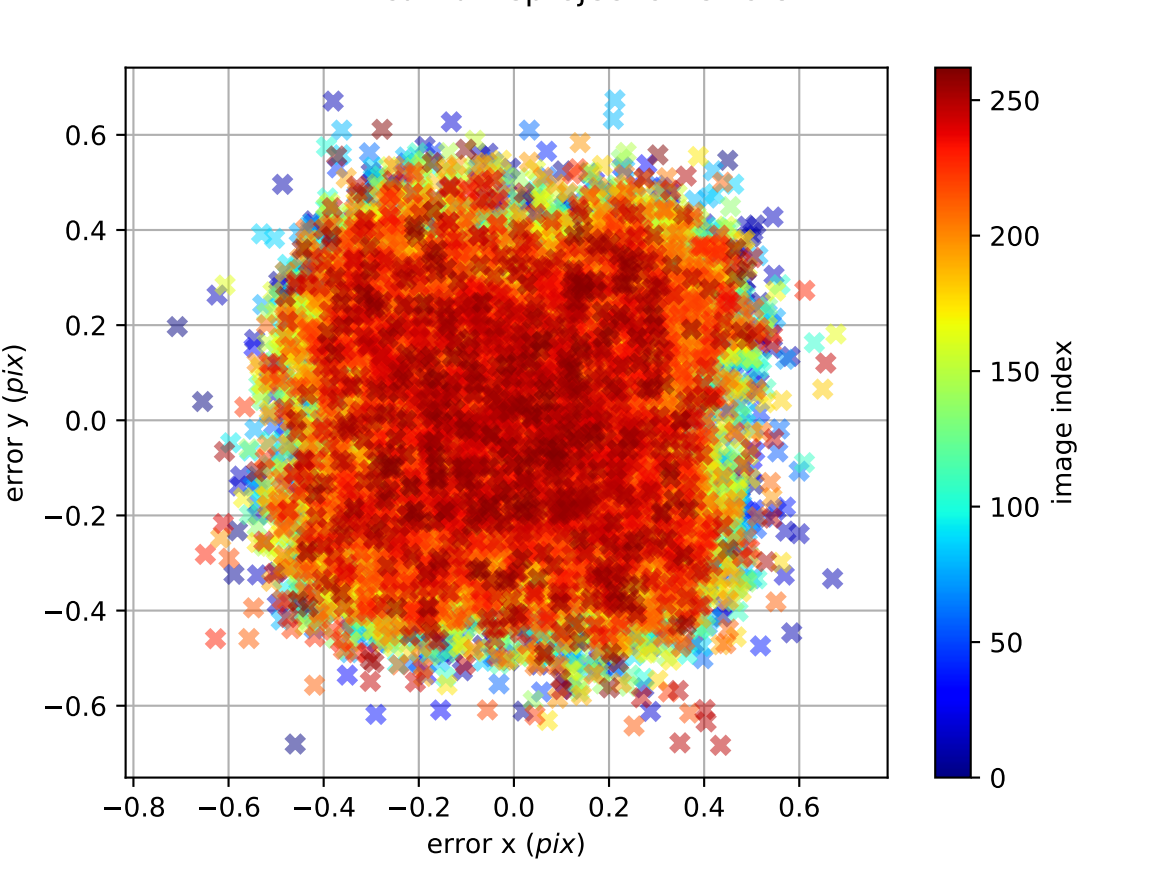

imu0: acceleration error
error (m/s^2)
1
0
−1
0
2000
4000
6000
8000
10000
12000
14000
error (m/s^2)
0.5
0.0
−0.5
0
2000
4000
6000
8000
10000
12000
14000
error (m/s^2)
2.5
0.0
−2.5
0
2000
4000
6000
8000
10000
12000
14000
error index


imu0: estimated accelerometer bias (imu frame)
bias (m/s^2)
−0.008
−0.010
0
10
20
30
40
50
bias (m/s^2)
−0.022
−0.024
0
10
20
30
40
50
bias (m/s^2)
−0.014
−0.016
0
10
20
30
40
50
time (s)


Comparison of predicted and measured angular velocities (body frame)
ang. velocity (rad/s)
ang. velocity (rad/s)
ang. velocity (rad/s)
est. bodyspline
imu0
est. bodyspline
imu0
est. bodyspline
imu0
0.5
0.0
−0.5
0
10
20
30
40
50
time (s)


imu0: angular velocities error
error (rad/s)
0.025
0.000
−0.025
0
2000
4000
6000
8000
10000
12000
14000
error (rad/s)
0.025
0.000
−0.025
−0.050
0
2000
4000
6000
8000
10000
12000
14000
error (rad/s)
0.025
0.000
−0.025
0
2000
4000
6000
8000
10000
12000
14000
error index


imu0: estimated gyro bias (imu frame)
bias (rad/s)
0.0001
0.0000
0
10
20
30
40
50
0.0000
−0.0001
bias (rad/s)
0.0001
0.0000
time (s)


cam0: reprojection errors
error x (pix)
error y (pix)
image index
−0.8
−0.6
−0.4
−0.2
0.0
0.2
0.4
0.6
0
50
100
150
200
250