Calibration results
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Normalized Residuals

Reprojection error (cam0): mean 0.33850463069402764, median 0.3066238335196179, std: 0.19867231461451346
Reprojection error (cam1): mean 0.35349646556500497, median 0.3206839678801055, std: 0.20600451649527135
Gyroscope error (imu0): mean 2.834096042346297, median 2.3523872684756255, std: 1.9885624724582078
Accelerometer error (imu0): mean 1.6039957113206205, median 1.1607405675580929, std: 1.5276105090480867

Residuals

Reprojection error (cam0) [px]: mean 0.33850463069402764, median 0.3066238335196179, std: 0.19867231461451346
Reprojection error (cam1) [px]: mean 0.35349646556500497, median 0.3206839678801055, std: 0.20600451649527135
Gyroscope error (imu0) [rad/s]: mean 0.007785334453846056, median 0.006462068107928399, std: 0.005462632070025838
Accelerometer error (imu0) [m/s^2]: mean 0.04647563420639552, median 0.03363235552664806, std: 0.04426237971042374

Transformation (cam0):

T_ci: (imu0 to cam0):
[[-0.00035955 0.9999146 -0.01306408 0.06888827]
[0.99999668 0.00032619 -0.00255579 0.00448479]
[-0.00255131 -0.01306495 -0.99991139 -0.00838657]
[0. 0. 0. 1.]]

T_ic: (cam0 to imu0):
[[-0.00035955 0.99999668 -0.00255131 -0.0044814]
[0.9999146 0.00032619 -0.01306495 -0.06899342]
[-0.01306408 -0.00255579 -0.99991139 -0.0074744]
[0. 0. 0. 1.]]

timeshift cam0 to imu0: [s] (t_imu = t_cam + shift)
-0.012250040444301804

Transformation (cam1):

T_ci: (imu0 to cam1):
[[-0.00573172 0.99998083 -0.00234113 -0.00637397]
[0.9999628   0.00571649 -0.00645917 0.00459158]
[-0.00644566 -0.00237806 -0.9999764 -0.00821631]
[0.   0.   0.   1.   ]]

T_ic: (cam1 to imu0):
[[-0.00573172 0.9999628 -0.00644566 -0.0046809]
[0.99998083 0.00571649 -0.00237806 0.00632807]
[-0.00234113 -0.00645917 -0.9999764 -0.00820139]
[0.   0.   0.   1.   ]]

timeshift cam1 to imu0: [s] (t_imu = t_cam + shift)
-0.012503498972287285

Baselines:

Baseline (cam0 to cam1):
[[0.99992808 -0.00539953 -0.01070916 -0.07532289]
[0.00544084 0.99997785 0.00383269 -0.00023578]
[0.01068823 -0.00389069 0.99993531 -0.00054913]
[0.   0.   0.   1.   ]]
baseline norm: 0.07532525895886506 [m]

Gravity vector in target coords: [m/s^2]
[-9.72017784 -0.08520444 -1.29588036]

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

cam0

Camera model: pinhole
Focal length: [568.758493707557, 568.0898833961045]
Principal point: [633.8144842785725, 346.30987409946977]
Distortion model: equidistant
Distortion coefficients: [0.024797346405976157, -0.06685379106623551, 0.07272744476764836, -0.0242044946199227]
Type: aprilgrid
Tags:
Rows: 6
Cols: 6
Size: 0.0294 [m]
Spacing 0.00882 [m]

cam1

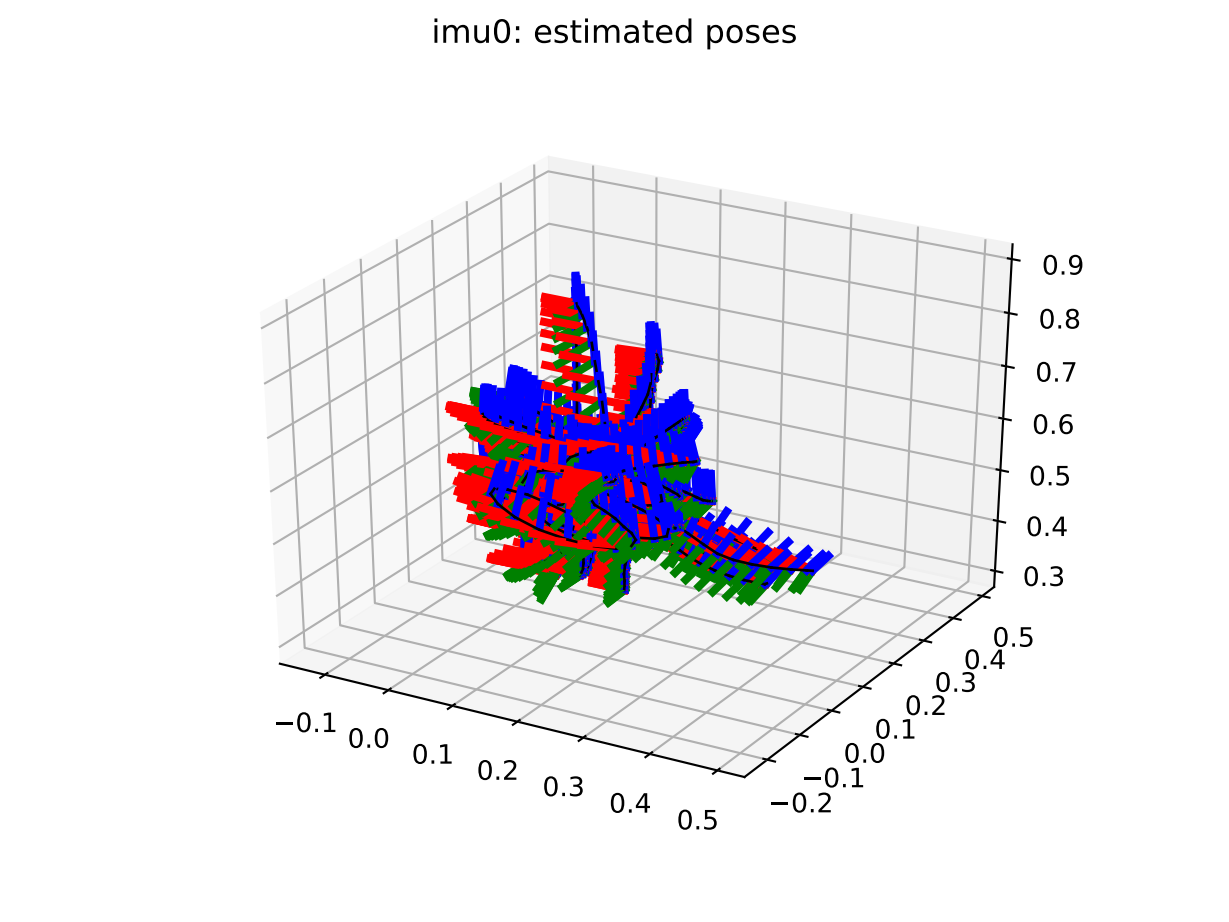
Camera model: pinhole
Focal length: [570.0854161194229, 569.2691971307967]
Principal point: [633.0348093652003, 324.4034604831896]
Distortion model: equidistant
Distortion coefficients: [-0.004842929678861597, 0.012593680458283641, -0.007138514180736794, 0.0027420897794787594]
Type: aprilgrid
Tags:
Rows: 6
Cols: 6
Size: 0.0294 [m]
Spacing 0.00882 [m]

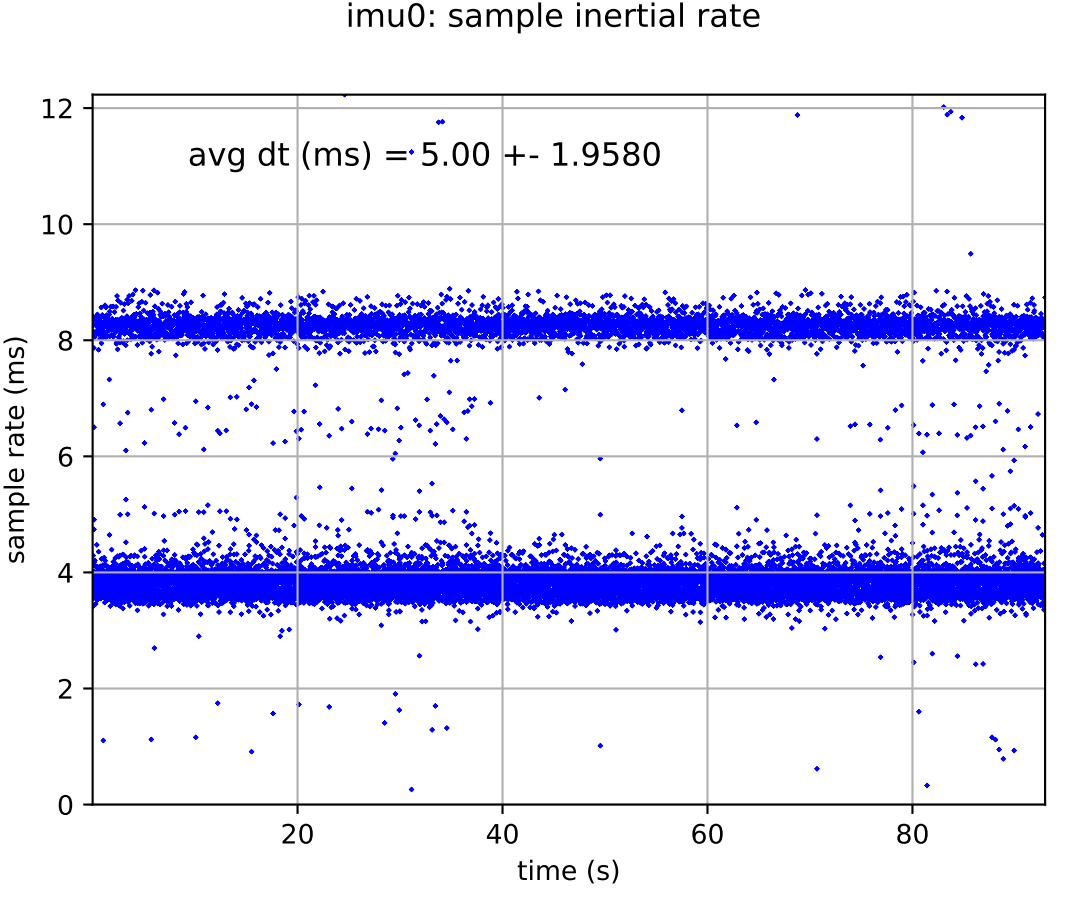
IMU configuration
==========

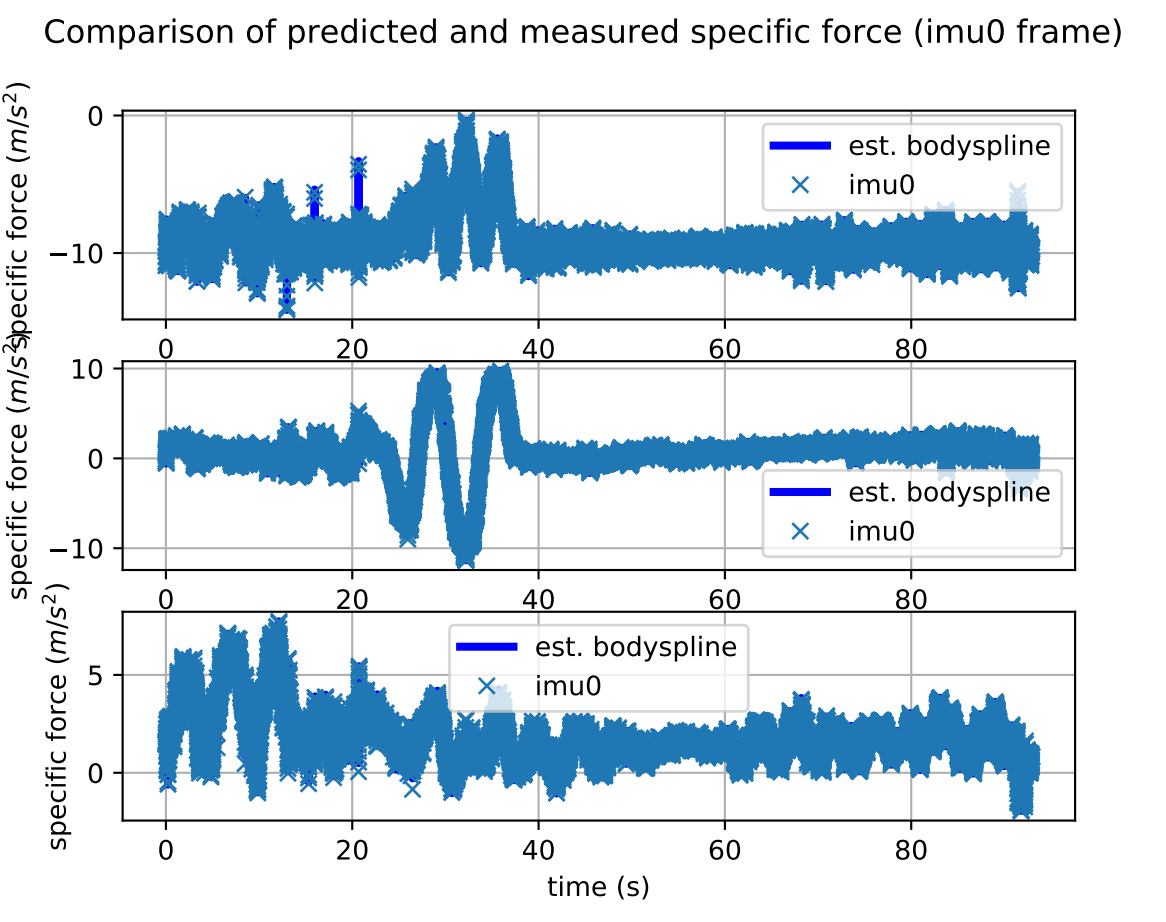
IMU0:

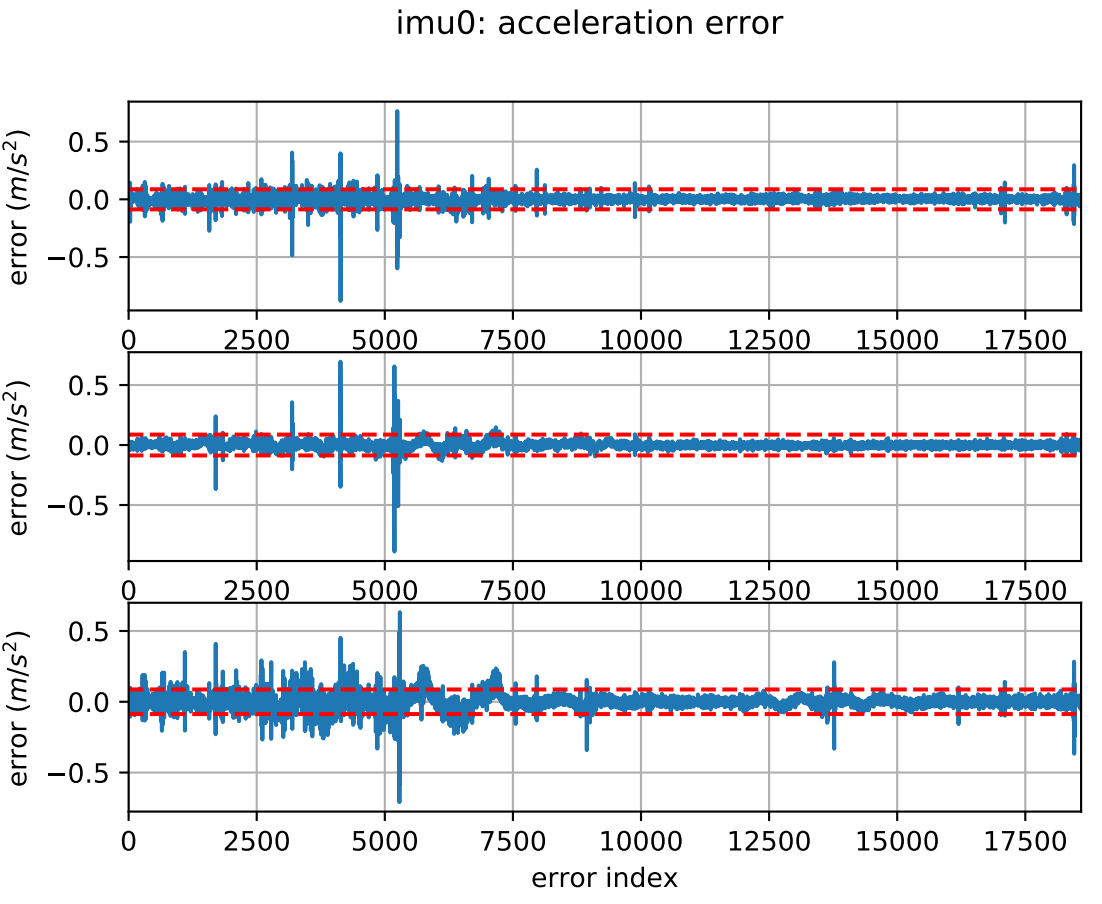
Model: calibrated
Update rate: 200

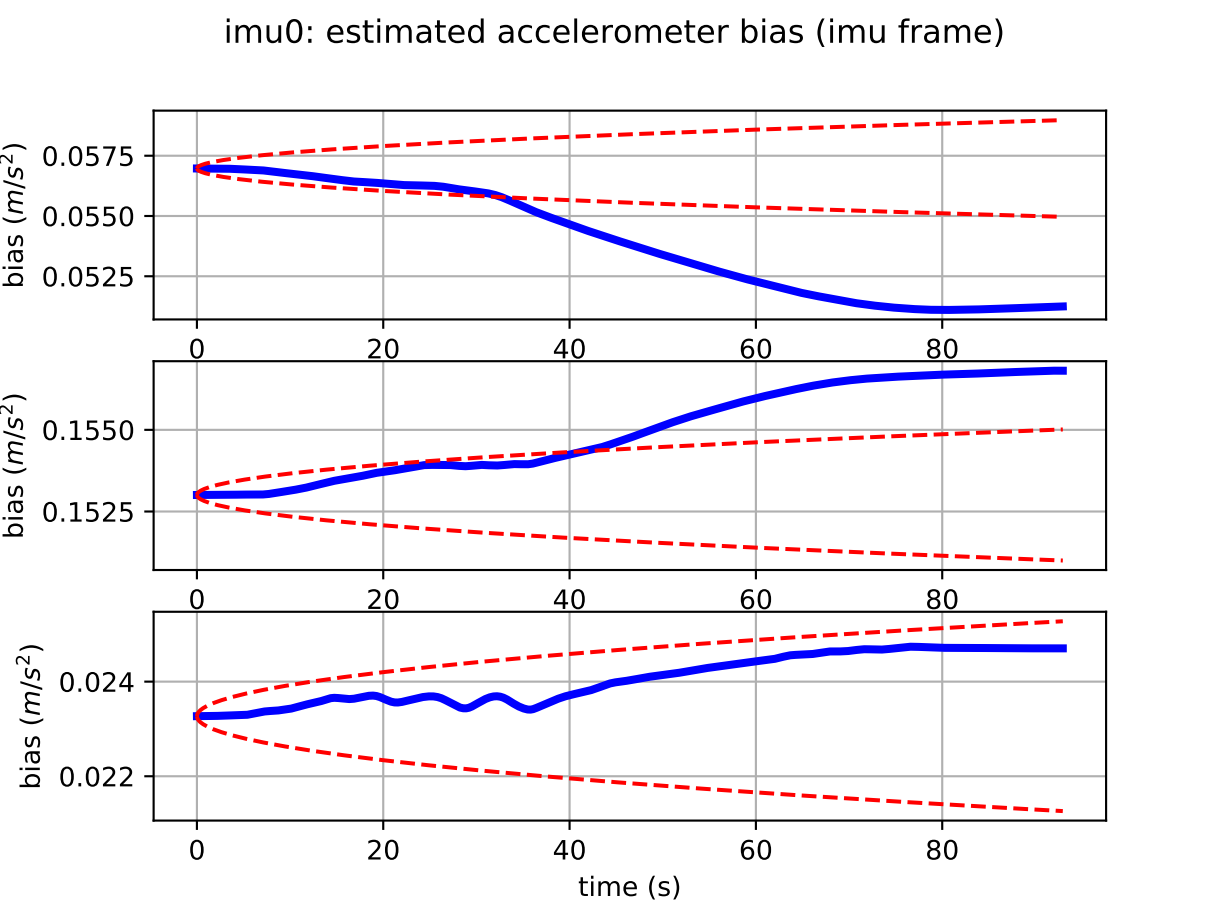
Accelerometer:
Noise density: 0.0020488356593067443
Noise density (discrete): 0.028974911764652198
Random walk: 6.936350514887526e-05
Gyroscope:
Noise density: 0.00019424404479822326
Noise density (discrete): 0.0027470256256385437
Random walk: 2.501600029485788e-06
T_ib (imu0 to imu0)
[[1. 0. 0. 0.]
[0. 1. 0. 0.]
[0. 0. 1. 0.]
[0. 0. 0. 1.]]
time offset with respect to IMU0: 0.0 [s]

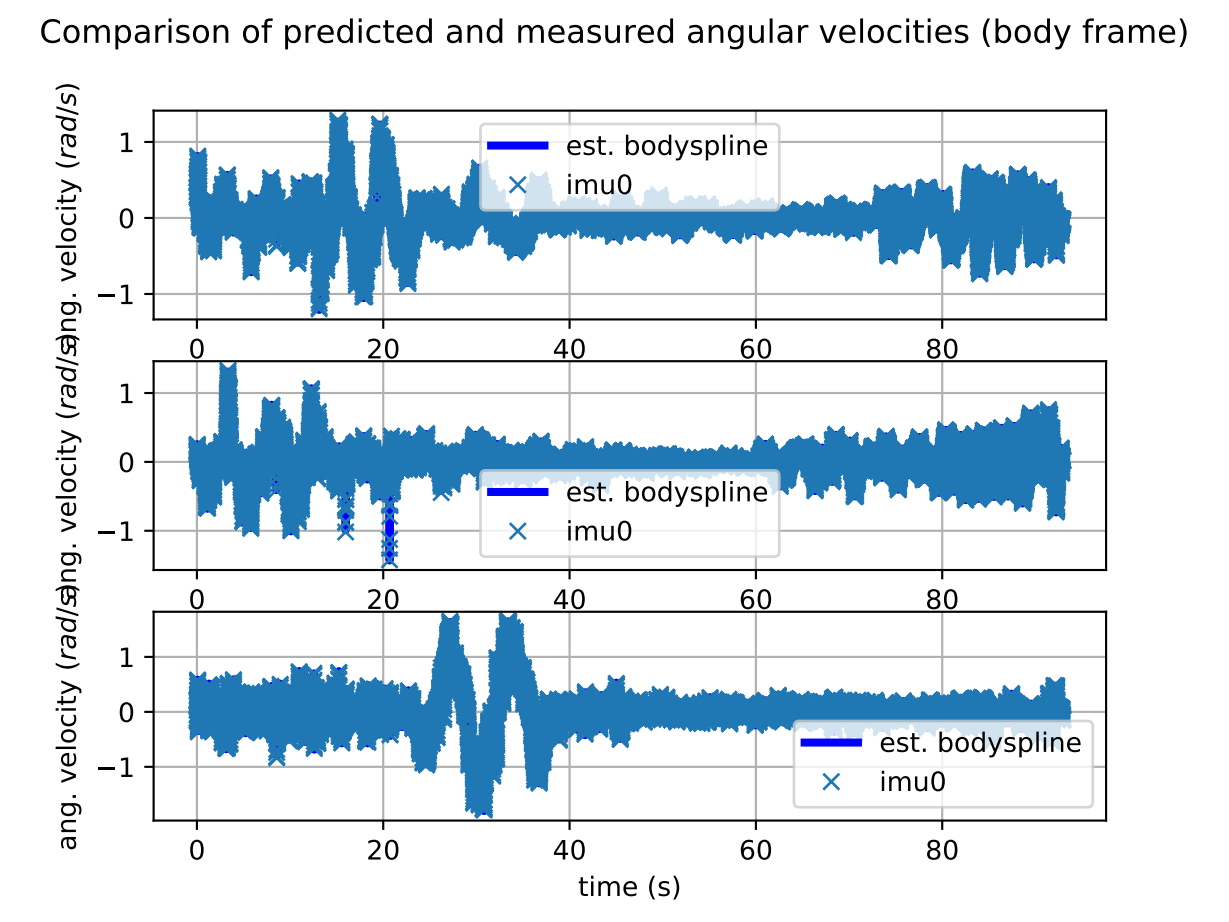

imu0: estimated poses
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.5
0.4
0.3
0.2
0.1
0.0
−0.1
−0.2
−0.1
0.0
0.1
0.2
0.3
0.4
0.5

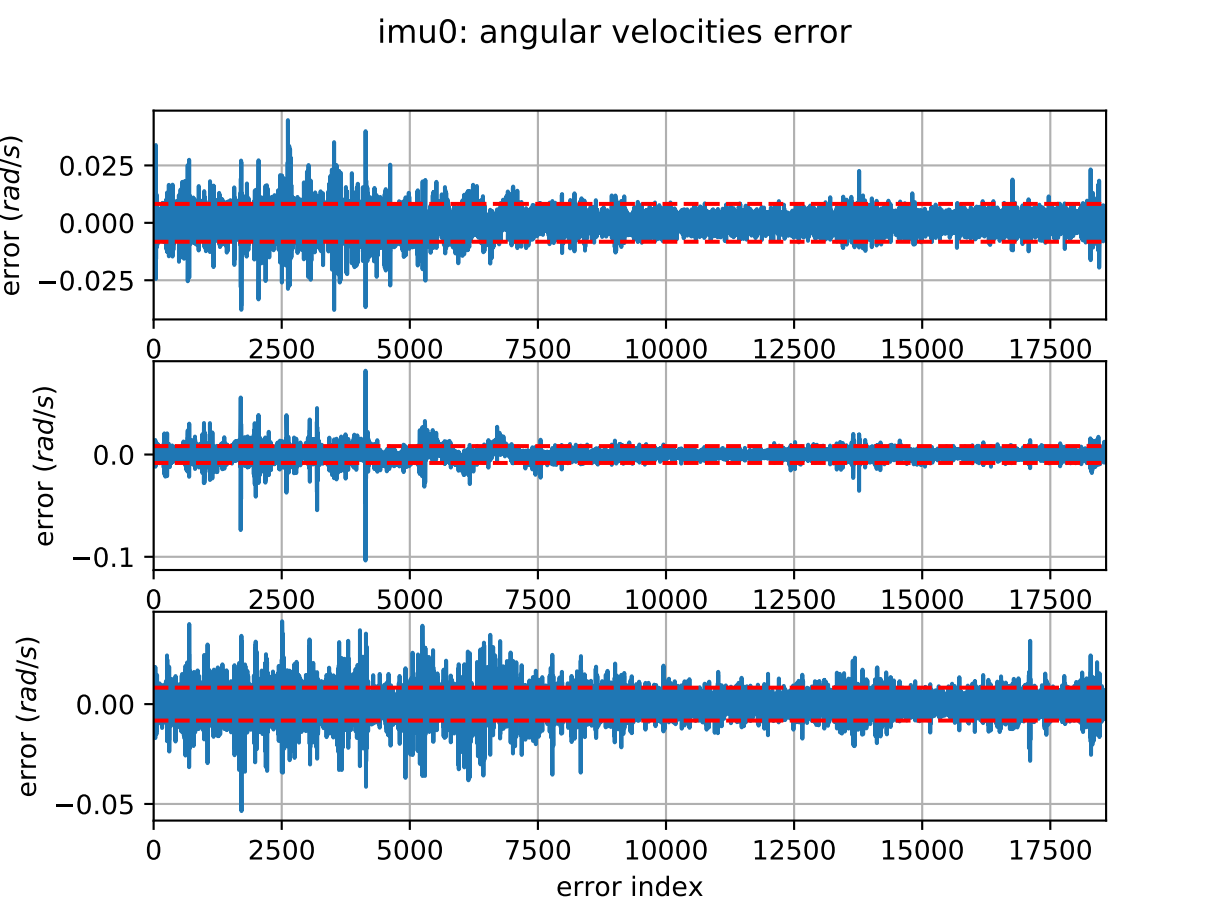

imu0: sample inertial rate
avg dt (ms) = 5.00 +- 1.9580
sample rate (ms)
time (s)
0
2
4
6
8
10
12
20
40
60
80

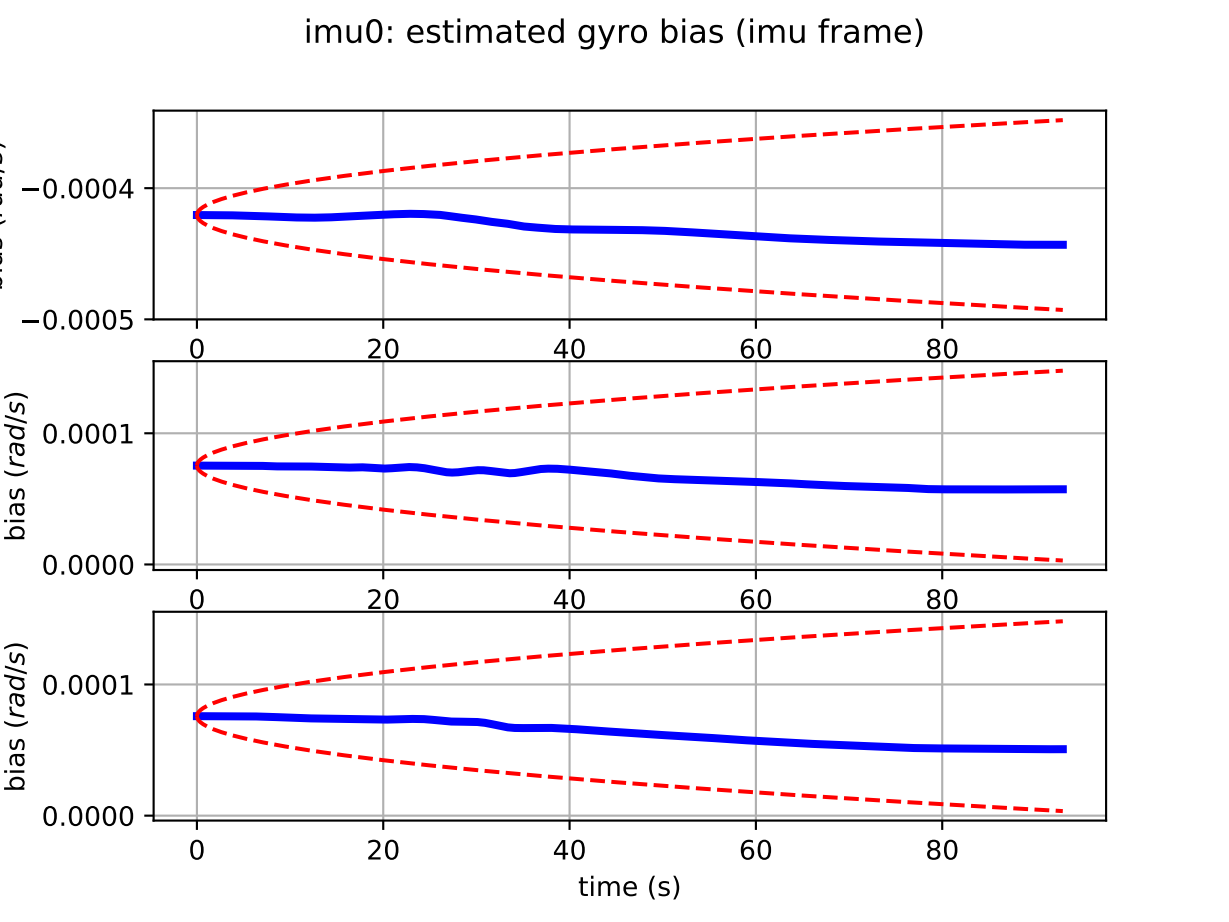

Comparison of predicted and measured specific force (imu0 frame)
specific force (m/s^2)
specific force (m/s^2)
specific force (m/s^2)
est. bodyspline
imu0
est. bodyspline
imu0
est. bodyspline
imu0
0
−10
10
0
−10
5
0
0
20
40
60
80
time (s)

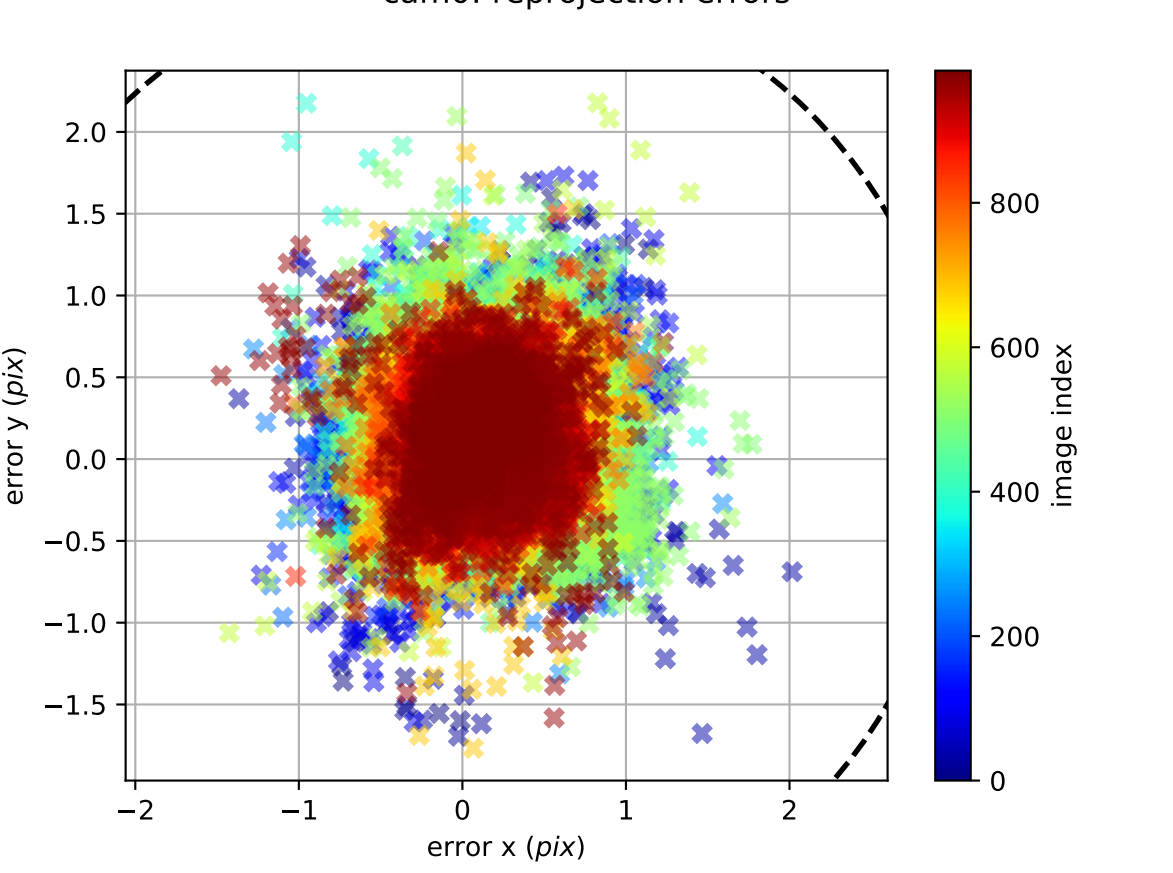

imu0: acceleration error
error (m/s^2)
0.5
0.0
−0.5
0
2500
5000
7500
10000
12500
15000
17500
error index

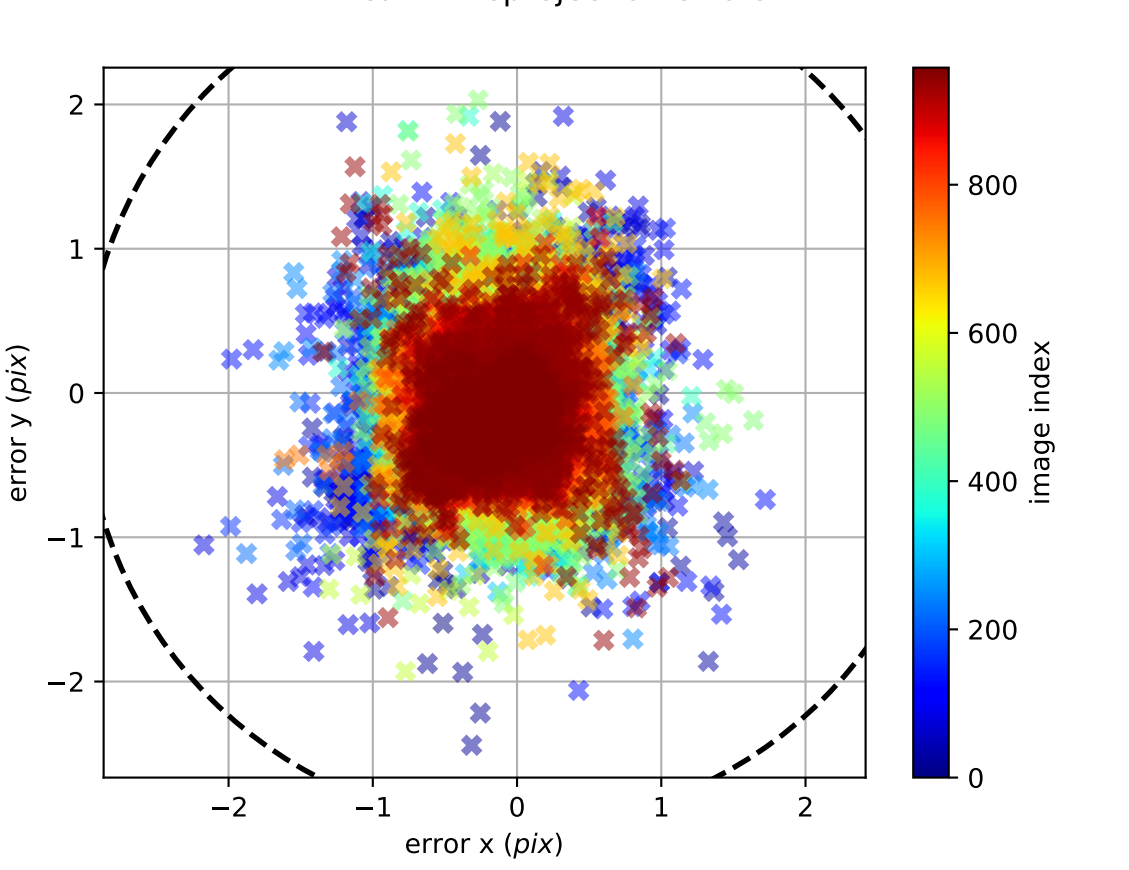

imu0: estimated accelerometer bias (imu frame)
bias (m/s^2)
0.0575
0.0550
0.0525
0
20
40
60
80
bias (m/s^2)
0.1550
0.1525
0
20
40
60
80
bias (m/s^2)
0.024
0.022
0
20
40
60
80
time (s)


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
1
0
−1
0
20
40
60
80
time (s)


imu0: angular velocities error
error (rad/s)
0.025
0.000
−0.025
0
2500
5000
7500
10000
12500
15000
17500
error (rad/s)
0.0
−0.1
0
2500
5000
7500
10000
12500
15000
17500
error (rad/s)
0.00
−0.05
0
2500
5000
7500
10000
12500
15000
17500
error index


imu0: estimated gyro bias (imu frame)
−0.0004
−0.0005
0
20
40
60
80
bias (rad/s)
0.0001
0.0000
0
20
40
60
80
bias (rad/s)
0.0001
0.0000
0
20
40
60
80
time (s)


cam0: reprojection errors
error x (pix)
error y (pix)
image index
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2
800
600
400
200
0


cam1: reprojection errors
error x (pix)
error y (pix)
image index
2
1
0
−1
−2
800
600
400
200
0