Calibration results
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Normalized Residuals

Reprojection error (cam0): mean 0.3531568269116583, median 0.30964106939626423, std: 0.22423737405288188
Gyroscope error (imu0): mean 2.7241988316283233e-11, median 6.299799833817686e-12, std: 2.7164314300262854e-10
Accelerometer error (imu0): mean 1.4740856451409675e-11, median 3.5489845535688036e-12, std: 1.663324702954036e-10

Residuals

Reprojection error (cam0) [px]: mean 0.3531568269116583, median 0.30964106939626423, std: 0.22423737405288188
Gyroscope error (imu0) [rad/s]: mean 1.4066246472697112e-12, median 3.252865986223506e-13, std: 1.40261399341735e-11
Accelerometer error (imu0) [m/s^2]: mean 3.675310580218652e-12, median 8.848617800301981e-13, std: 4.147136836490532e-11

Transformation (cam0):

T_ci: (imu0 to cam0):
[[0.05347634 -0.99235624 0.11121772 0.00010059]
 [-0.980218   -0.07342136 -0.18379872 -0.00017367]
 [0.19055956 -0.09918873 -0.97665175 -0.00000866]
 [0.   0.   0.   1.   ]]

T_ic: (cam0 to imu0):
[[0.05347634 -0.980218   0.19055956 -0.00017396]
 [-0.99235624 -0.07342136 -0.09918873 0.00008621]
 [0.11121772 -0.18379872 -0.97665175 -0.00005156]
 [0.   0.   0.   1.   ]]

timeshift cam0 to imu0: [s] (t_imu = t_cam + shift)
-0.39949292436479483

Gravity vector in target coords: [m/s^2]
[-0.90584664 -9.59985959 1.78621402]

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

cam0

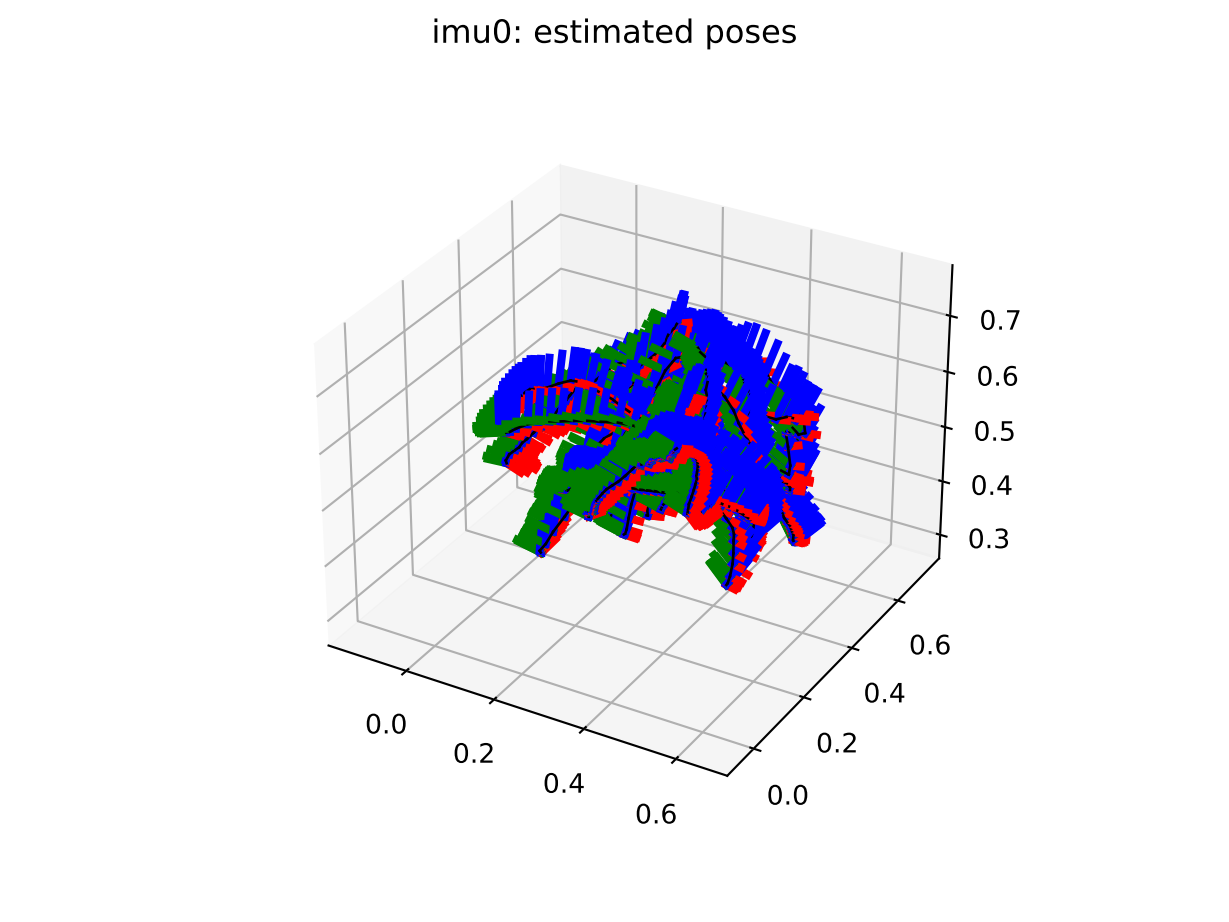
  Camera model: pinhole
  Focal length: [361.65862437029585, 483.6653441861979]
  Principal point: [318.5895971382657, 243.62500577183735]
  Distortion model: radtan
  Distortion coefficients: [-0.3968364649935277, 0.1376412687903212, 0.00022240368002503756,
0.0002960657813114394]
  Type: aprilgrid
  Tags:
    Rows: 6
    Cols: 6
    Size: 0.055 [m]
    Spacing 0.0165 [m]

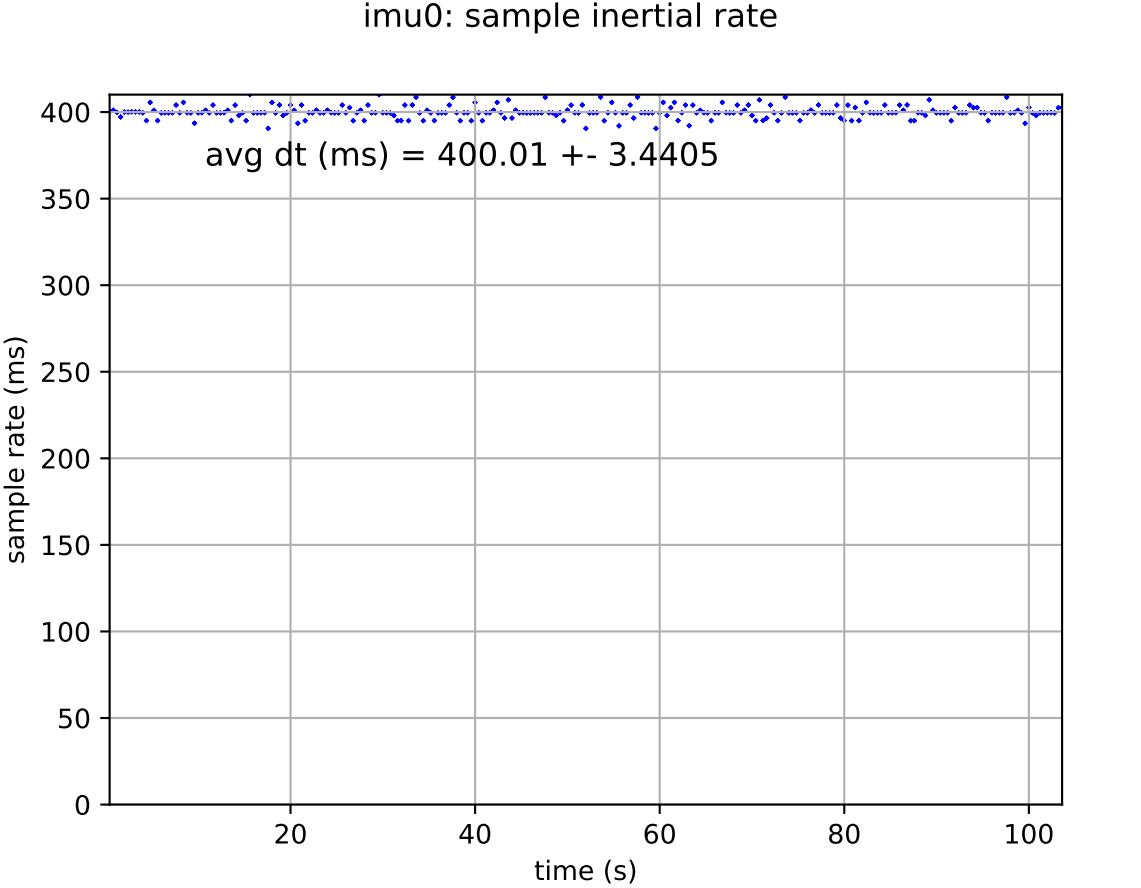
IMU configuration
==================

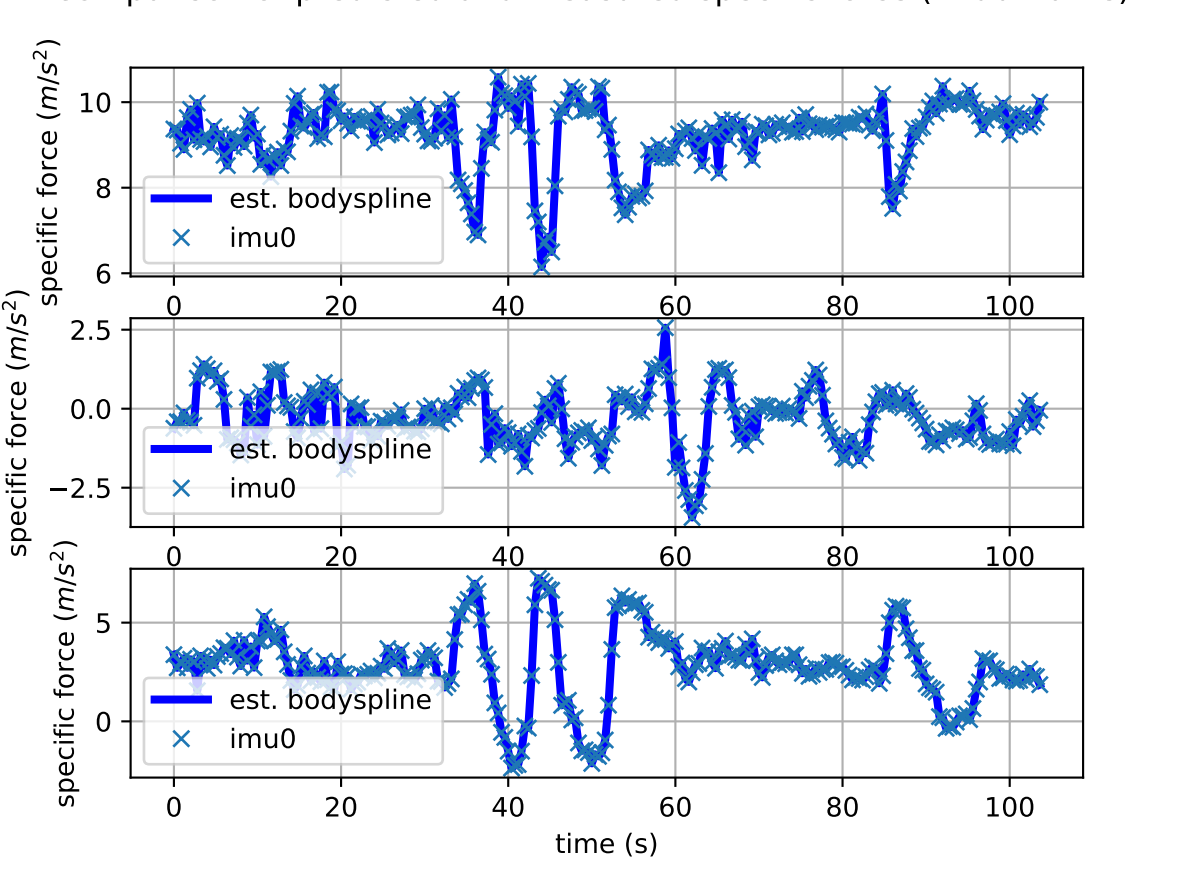
IMU0:

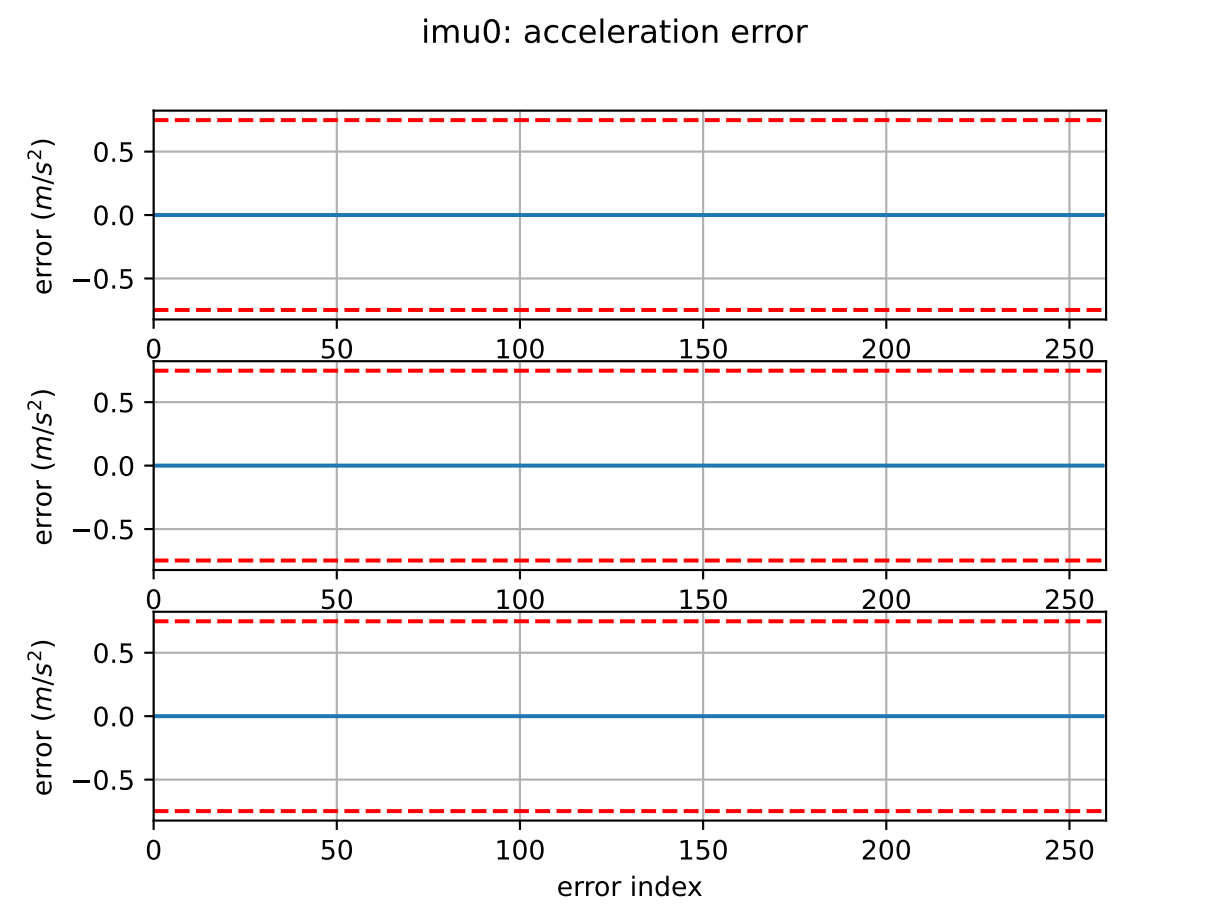
  Model: calibrated
  Update rate: 200.0
  Accelerometer:
    Noise density: 0.01763016309673612
    Noise density (discrete): 0.24932815758253865
    Random walk: 0.0009121684278958112
  Gyroscope:
    Noise density: 0.00365110584117691
    Noise density (discrete): 0.051634433982520135
    Random walk: 6.888677868055541e-05

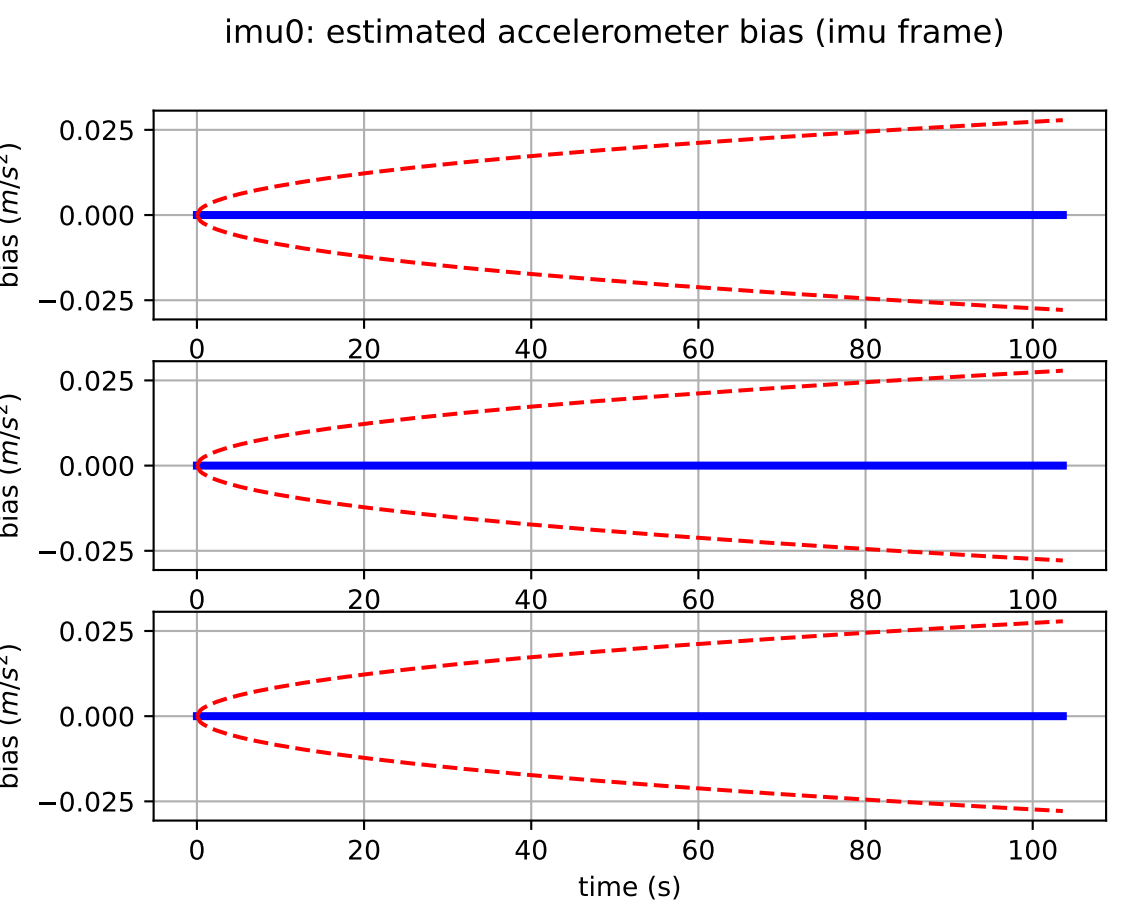
T_ib (imu0 to imu0)
  [[1. 0. 0. 0.]
   [0. 1. 0. 0.]
   [0. 0. 1. 0.]
   [0. 0. 0. 1.]]
time offset with respect to IMU0: 0.0 [s]

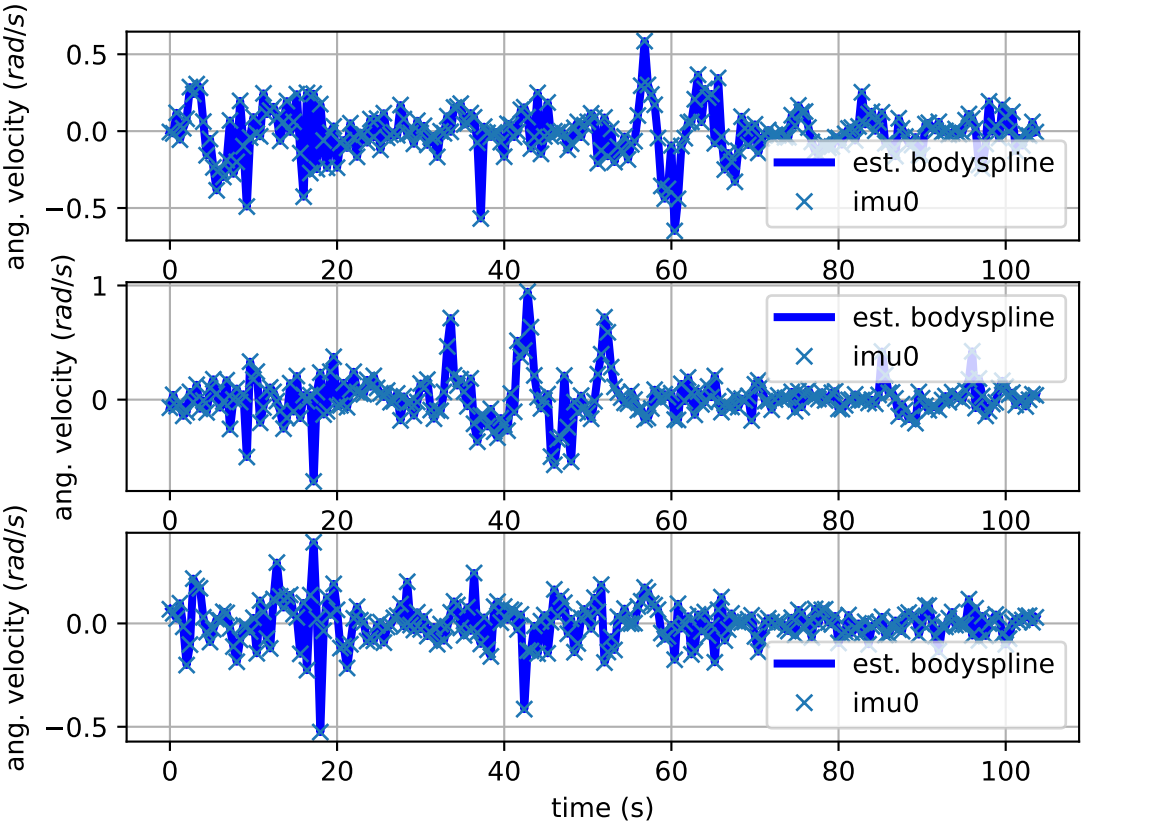

imu0: estimated poses
0.7
0.6
0.5
0.4
0.3
0.6
0.4
0.2
0.0
0.0
0.2
0.4
0.6

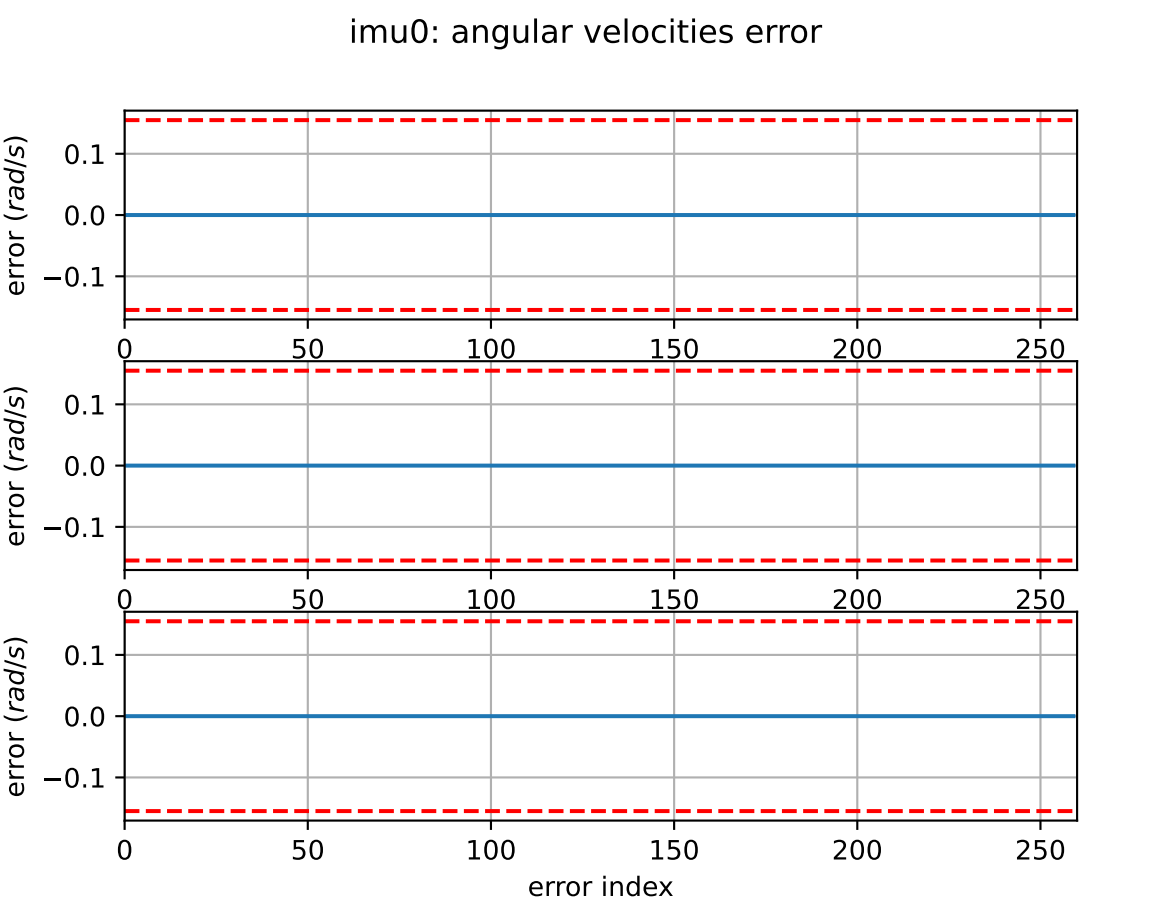

imu0: sample inertial rate
avg dt (ms) = 400.01 +- 3.4405
sample rate (ms)
time (s)
0
50
100
150
200
250
300
350
400
20
40
60
80
100

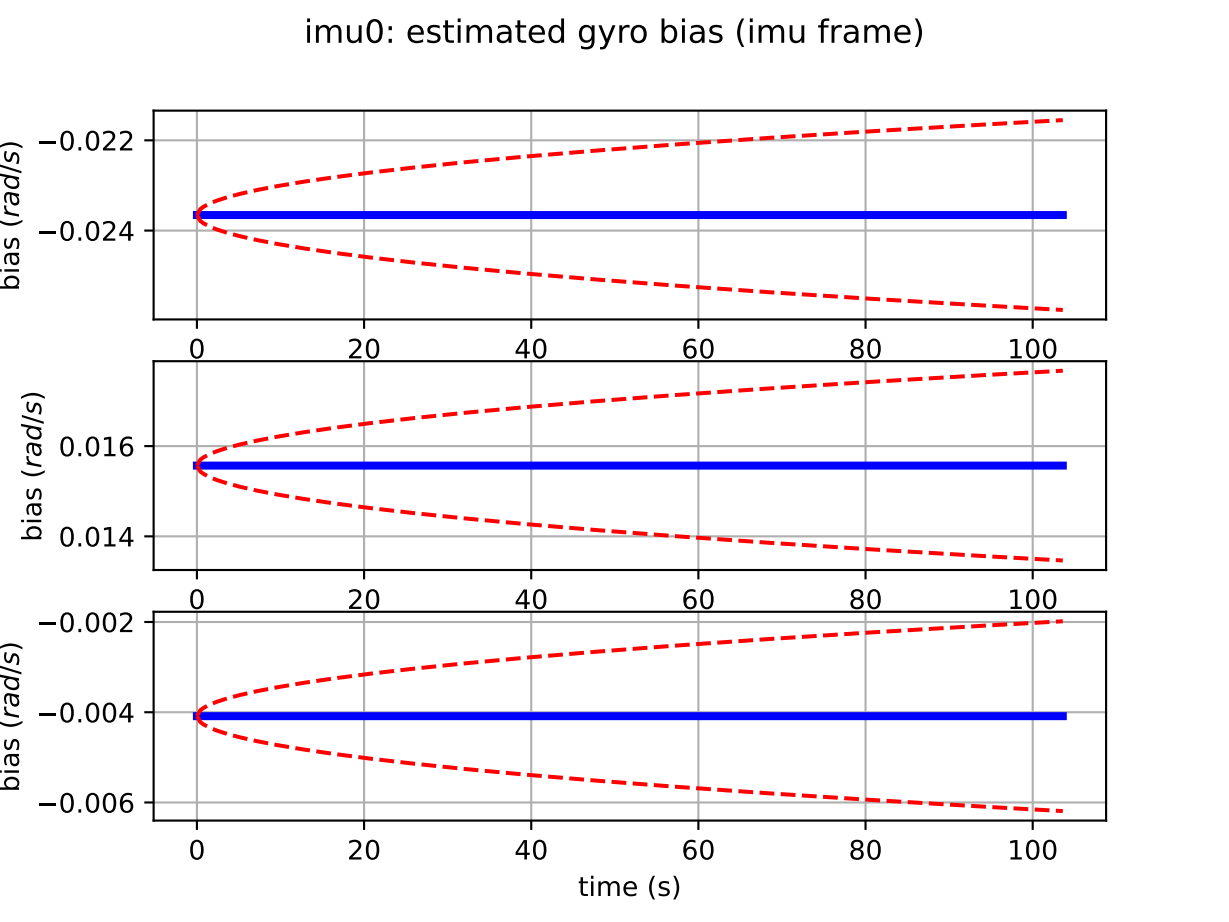

Comparison of predicted and measured specific force (imu0 frame)
specific force (m/s^2)
specific force (m/s^2)
specific force (m/s^2)
est. bodyspline
imu0
est. bodyspline
imu0
est. bodyspline
imu0
10
8
6
2.5
0.0
−2.5
5
0
0
20
40
60
80
100
time (s)

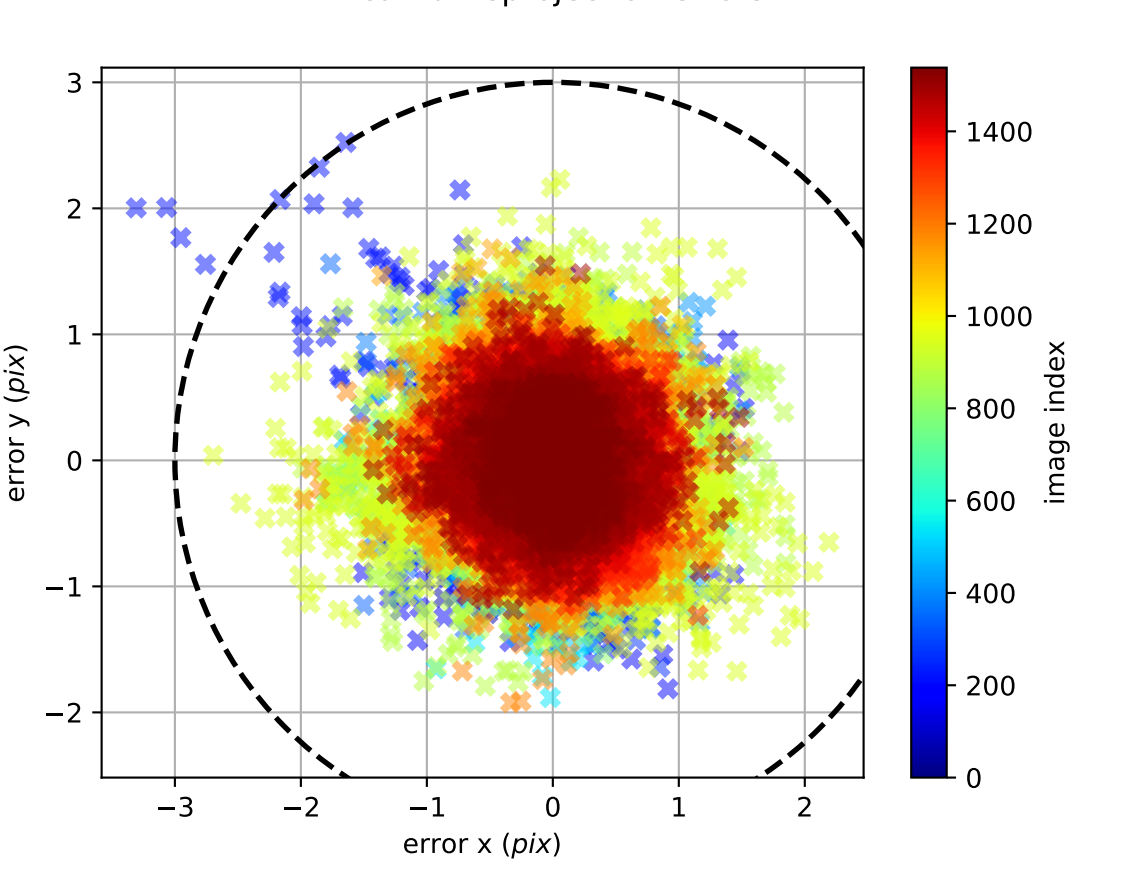

imu0: acceleration error
error (m/s^2)
0.5
0.0
−0.5
0
50
100
150
200
250
error index


imu0: estimated accelerometer bias (imu frame)
bias (m/s^2)
0.025
0.000
−0.025
0
20
40
60
80
100
time (s)


Comparison of predicted and measured angular velocities (body frame)
ang. velocity (rad/s)
0.5
0.0
−0.5
0
20
40
60
80
100
est. bodyspline
imu0
ang. velocity (rad/s)
1
0
ang. velocity (rad/s)
0.0
−0.5
time (s)


imu0: angular velocities error
error (rad/s)
0.1
0.0
−0.1
0
50
100
150
200
250
error index


imu0: estimated gyro bias (imu frame)
bias (rad/s)
−0.022
−0.024
0
20
40
60
80
100
bias (rad/s)
0.016
0.014
0
20
40
60
80
100
bias (rad/s)
−0.002
−0.004
−0.006
0
20
40
60
80
100
time (s)


cam0: reprojection errors
error x (pix)
error y (pix)
image index
3
2
1
0
−1
−2
−3
1400
1200
1000
800
600
400
200
0