

Calibration results

Normalized Residuals

Reprojection error (cam0): mean 0.5175862840394784, median 0.4016384260415893, std: 0.43481792397276503
Gyroscope error (imu0): mean 1.1389677547282773, median 0.9046086179207804, std: 0.8744231920566471
Accelerometer error (imu0): mean 0.5351089944562323, median 0.4547291221907699, std: 0.3408890482870113
Gyroscope error (imu1): mean 0.6610854971174047, median 0.5098315684360688, std: 0.5264413849451314
Accelerometer error (imu1): mean 0.5570088549998018, median 0.4844410096271336, std: 0.3494258744557038

Residuals

Reprojection error (cam0) [px]: mean 0.5175862840394784, median 0.4016384260415893, std: 0.43481792397276503
Gyroscope error (imu0) [rad/s]: mean 0.0048536513102288605, median 0.003854942148615076, std:
0.0037263085405194545
Accelerometer error (imu0) [m/s^2]: mean 0.10705783060349101, median 0.0909764437494527, std:
0.068200763515817
Gyroscope error (imu1) [rad/s]: mean 0.013583283782897138, median 0.010475478445289198, std:
0.010816759341948135
Accelerometer error (imu1) [m/s^2]: mean 0.05703254391163071, median 0.049602269167092594, std:
0.035777970762712524

Transformation (cam0):

T_ci: (imu0 to cam0):

```
[[-0.01472734 -0.99975055 -0.01679123  0.03993824]
 [-0.05130052  0.01752643 -0.99852946 -0.11186068]
 [ 0.99857467 -0.01384428 -0.05154584 -0.12417108]
 [ 0.          0.          1.          ]]
```

T_ic: (cam0 to imu0):

```
[[-0.01472734 -0.05130052  0.99857467  0.11884377]
 [-0.99975055  0.01752643 -0.01384428  0.04016973]
 [-0.01679123 -0.99852946 -0.05154584 -0.11742608]
 [ 0.          0.          1.          ]]
```

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

0.023254825488191154

Gravity vector in target coords: [m/s²]
[-0.03418676 -9.80649041 0.00019449]

Calibration configuration

cam0

Camera model: pinhole

Focal length: [581.1303265478947, 581.467887625284]

Principal point: [343.6828365250734, 273.8167096163441]

Distortion model: radtan

Distortion coefficients: [0.08382439416254173, -0.12969976579269596, 0.01050246520757501, 0.00914606335682514]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.088 [m]

Spacing 0.02639999999999996 [m]

IMU configuration

IMU0:

Model: calibrated

Update rate: 100

Accelerometer:

Noise density: 0.02000673352767714

Noise density (discrete): 0.2000673352767714

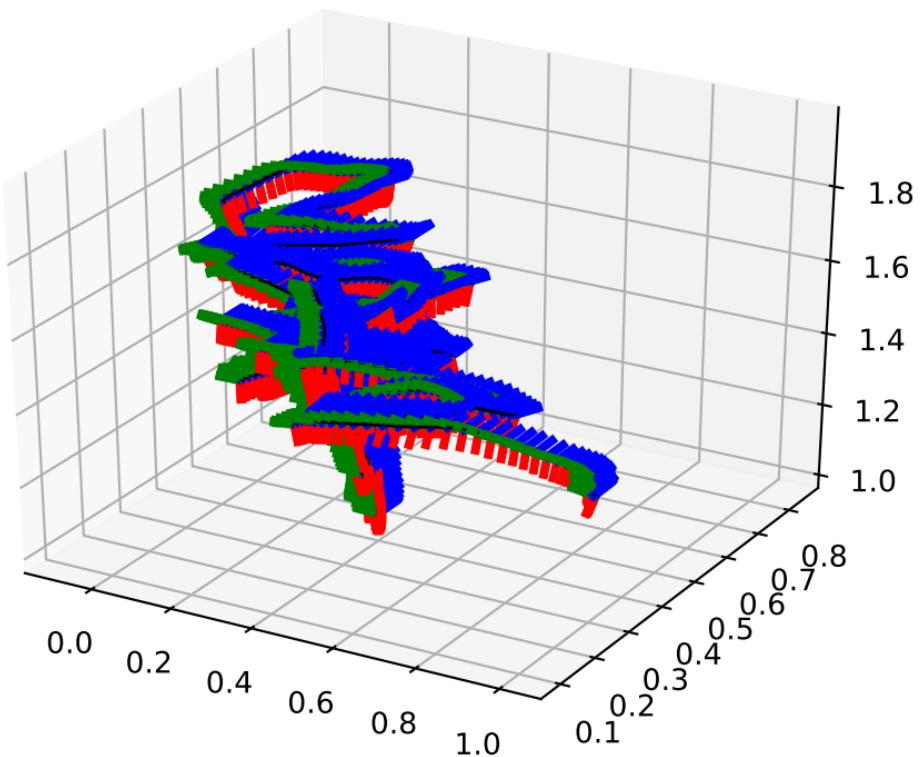
Random walk: 0.001224627431466927

Gyroscope:
Noise density: 0.0004261447516911305
Noise density (discrete): 0.004261447516911304
Random walk: 2.14534407581717e-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]

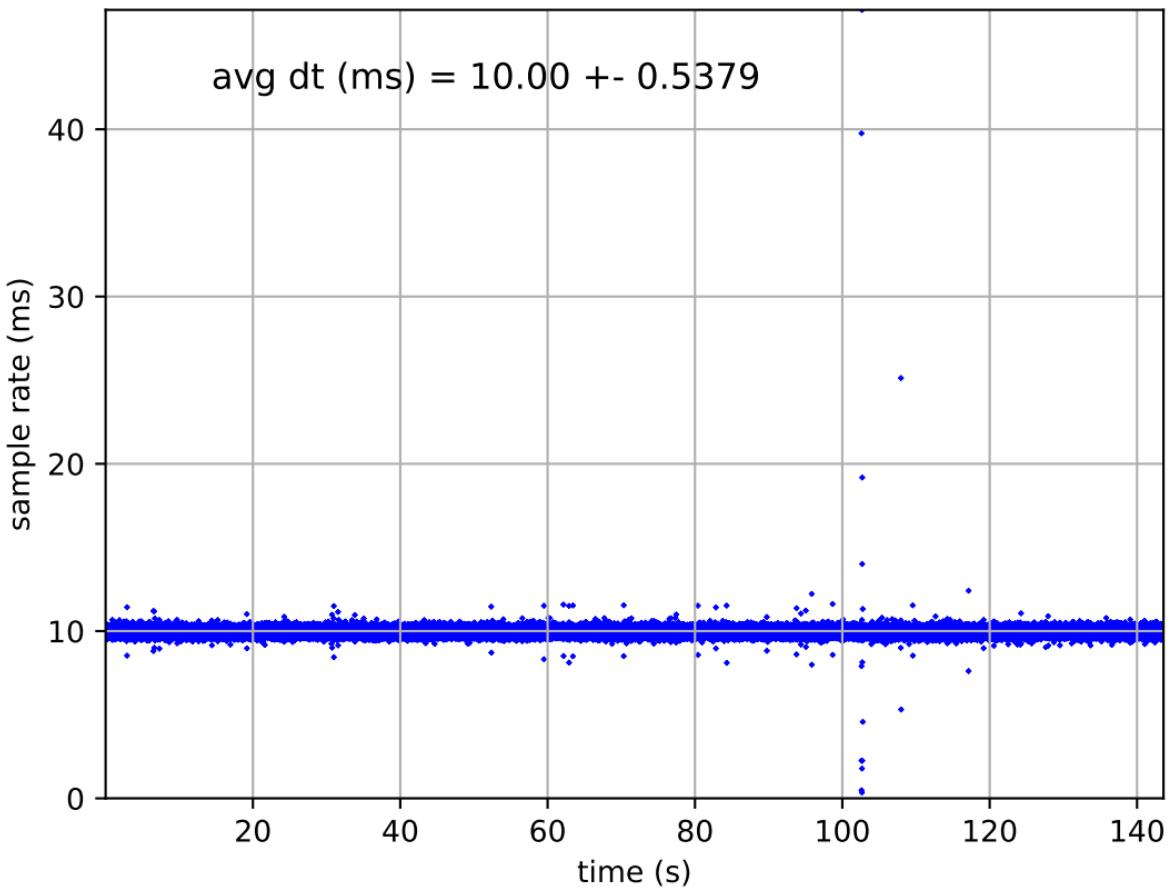
IMU1:

Model: calibrated
Update rate: 400
Accelerometer:
Noise density: 0.005119536556707974
Noise density (discrete): 0.10239073113415947
Random walk: 0.0007446449364276494
Gyroscope:
Noise density: 0.0010273469802412588
Noise density (discrete): 0.020546939604825173
Random walk: 3.8743601798420855e-05
 T_{ib} (imu0 to imu1)
[[-0.00631694 -0.99992376 0.01061034 0.02102086]
[-0.02330857 -0.01046043 -0.99967359 -0.08087949]
[0.99970836 -0.00656219 -0.02324071 -0.05481246]
[0. 0. 0. 1.]]
time offset with respect to IMU0: 0.0 [s]

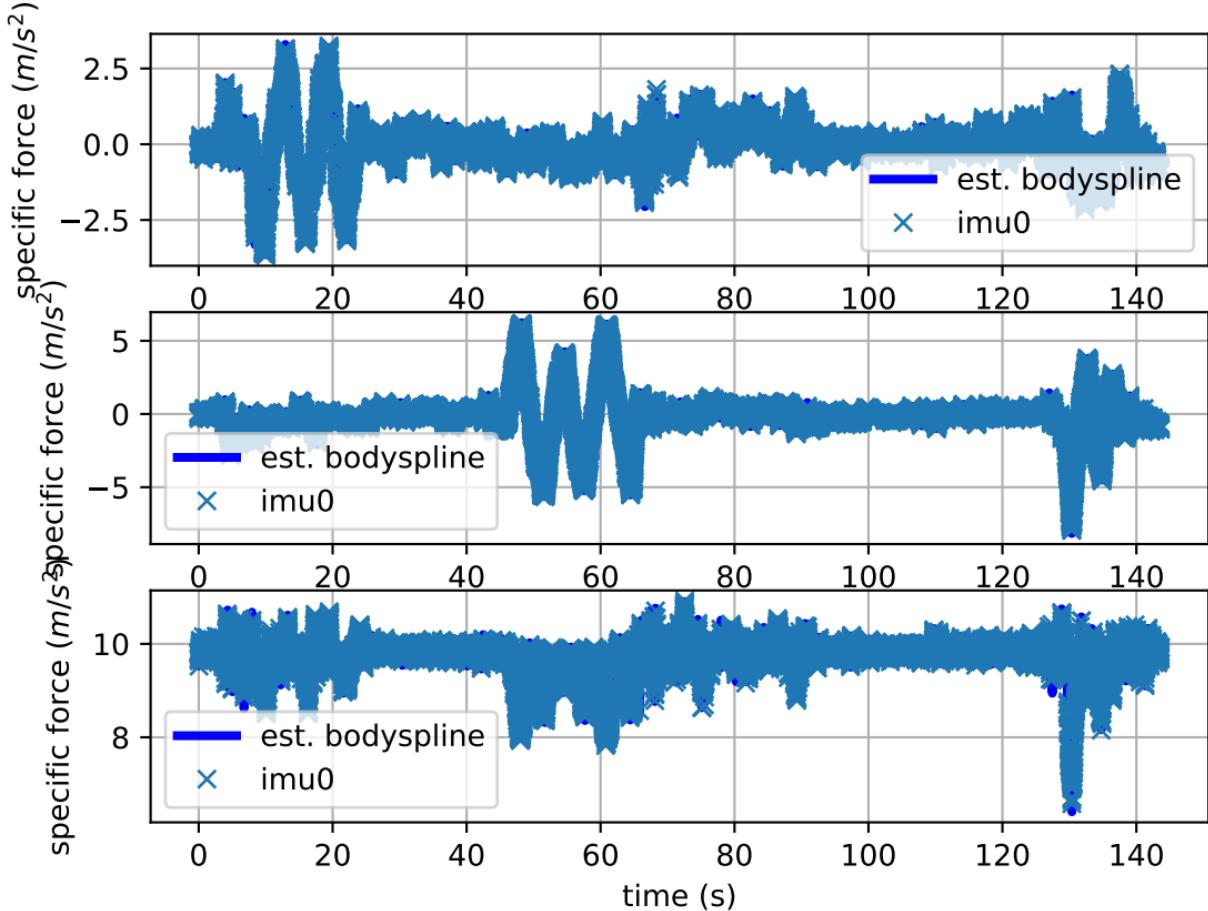
imu0: estimated poses



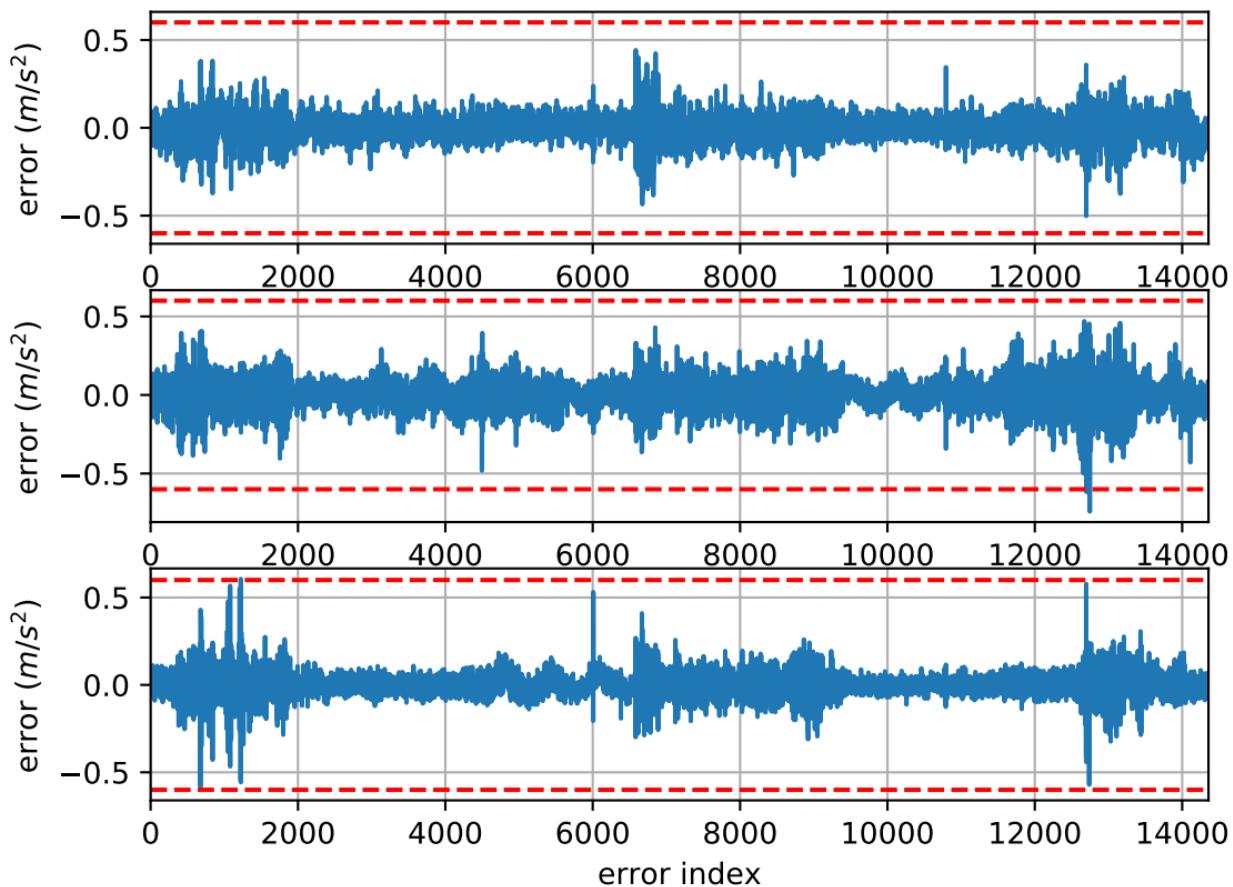
imu0: sample inertial rate



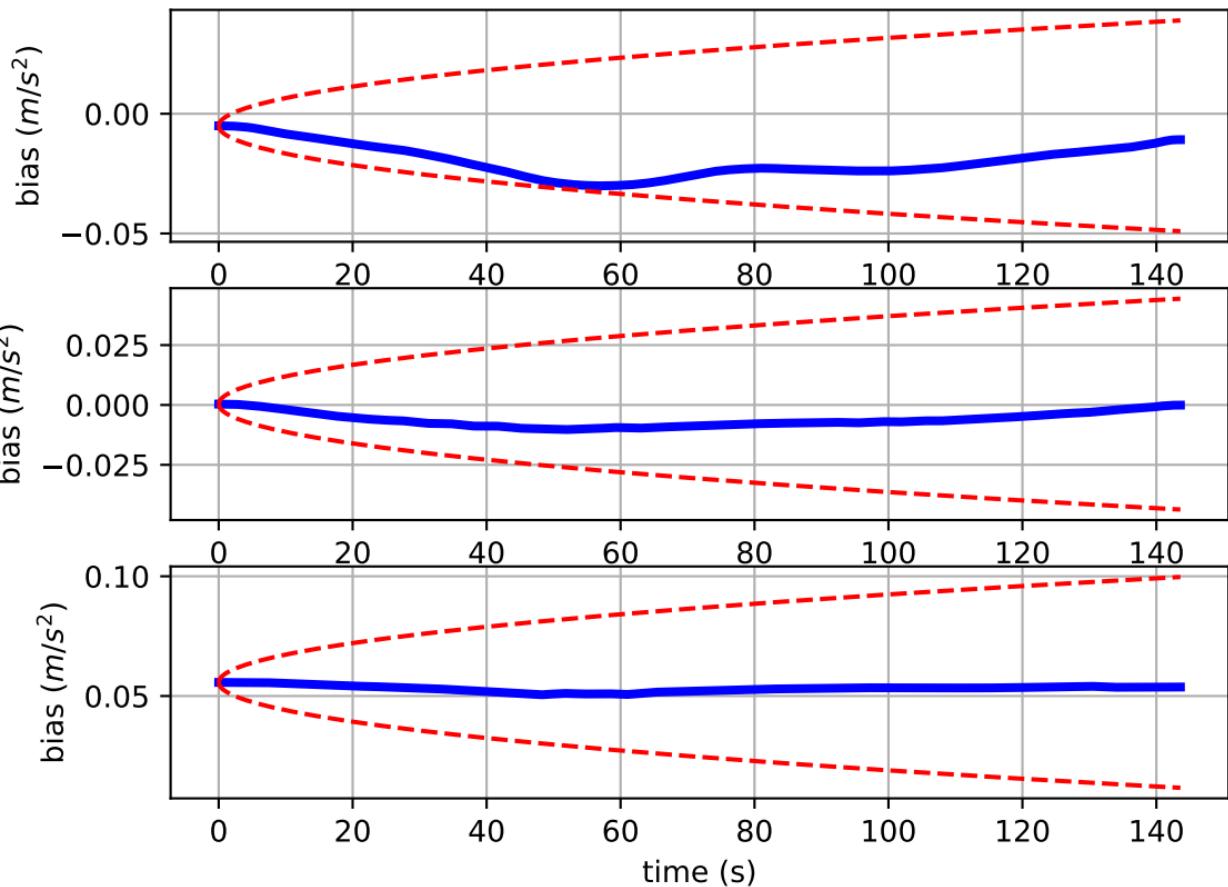
Comparison of predicted and measured specific force (imu0 frame)



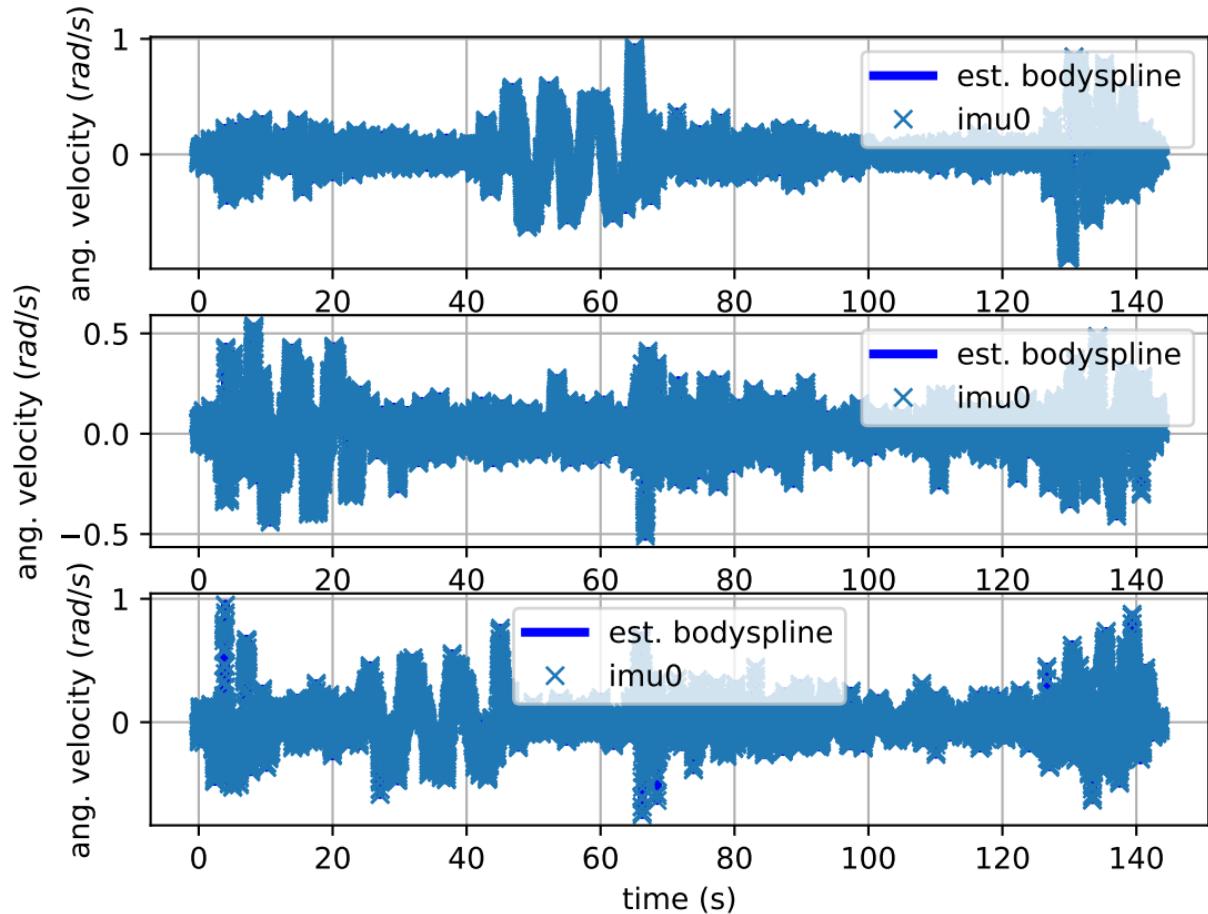
imu0: acceleration error



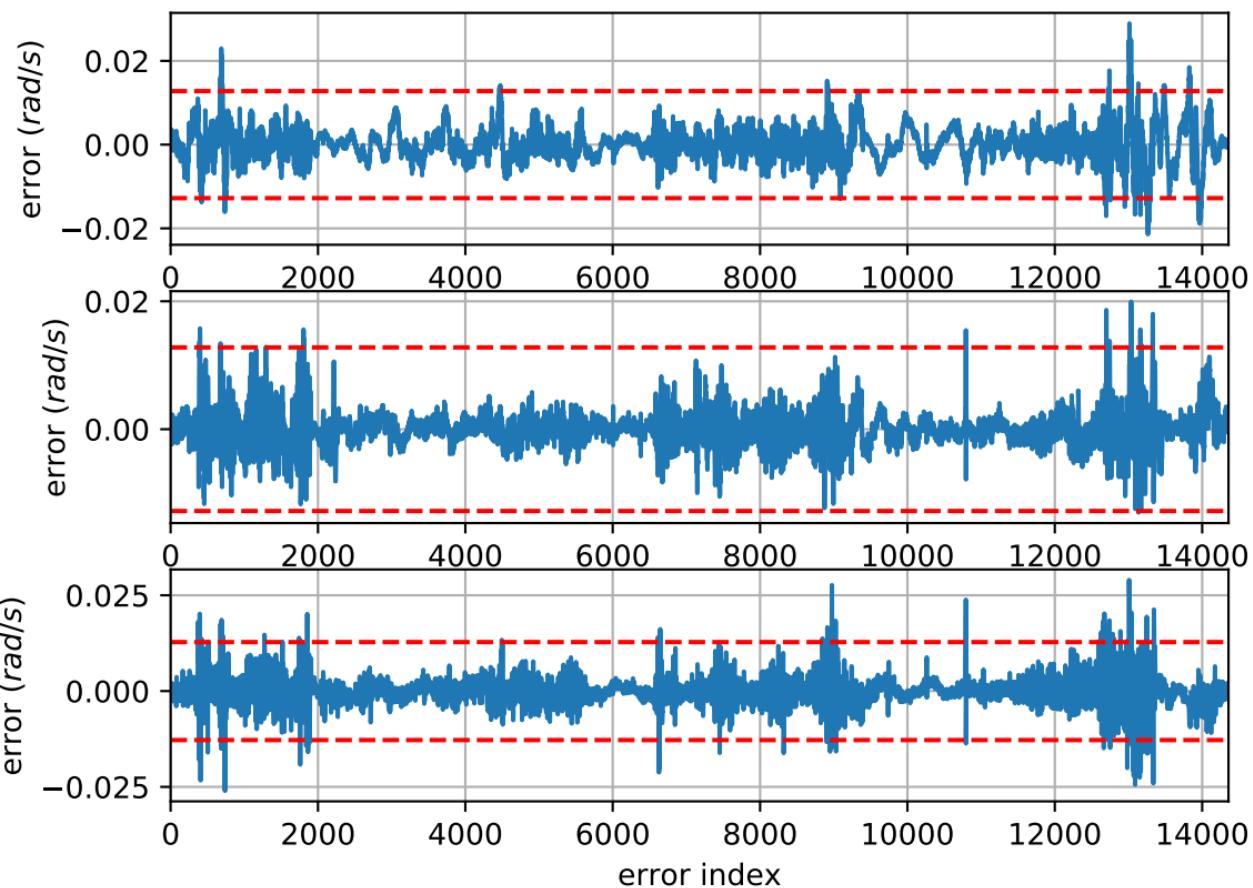
imu0: estimated accelerometer bias (imu frame)



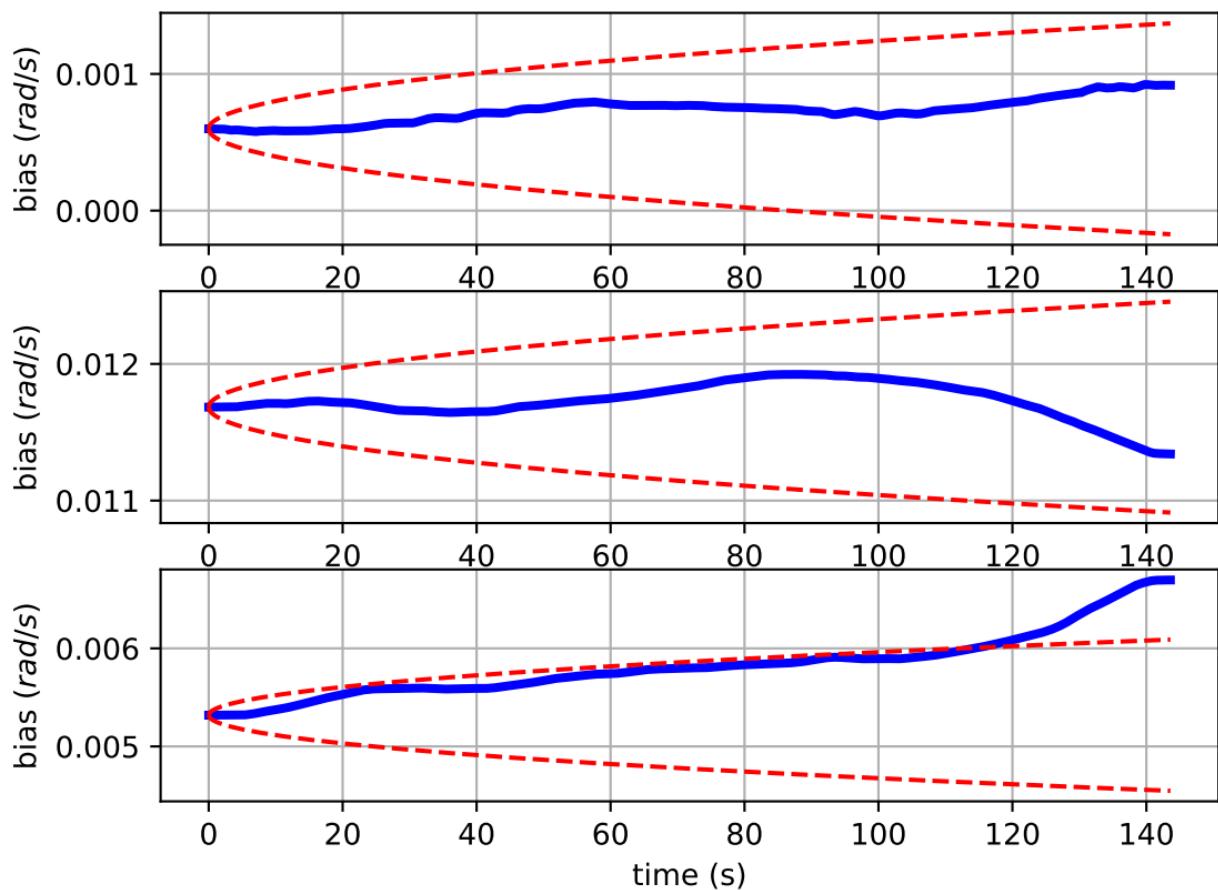
Comparison of predicted and measured angular velocities (body frame)



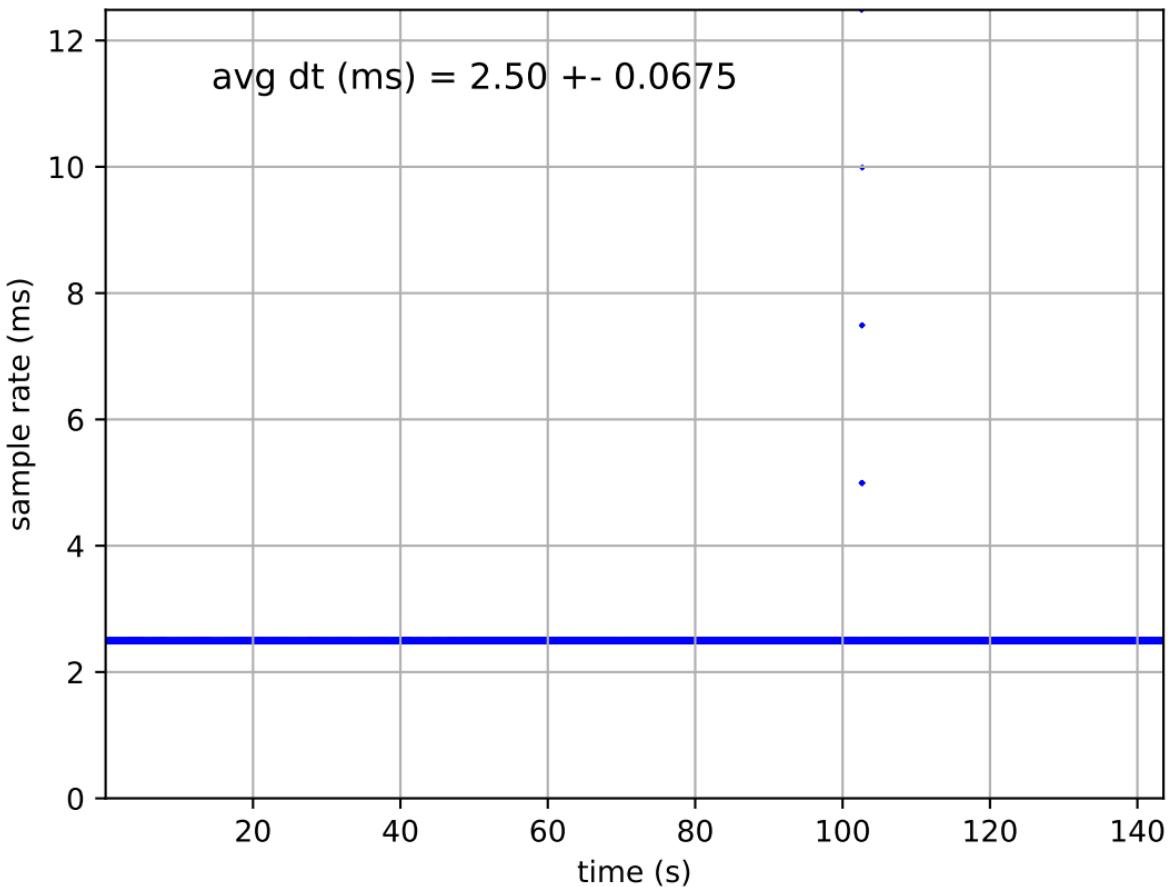
imu0: angular velocities error



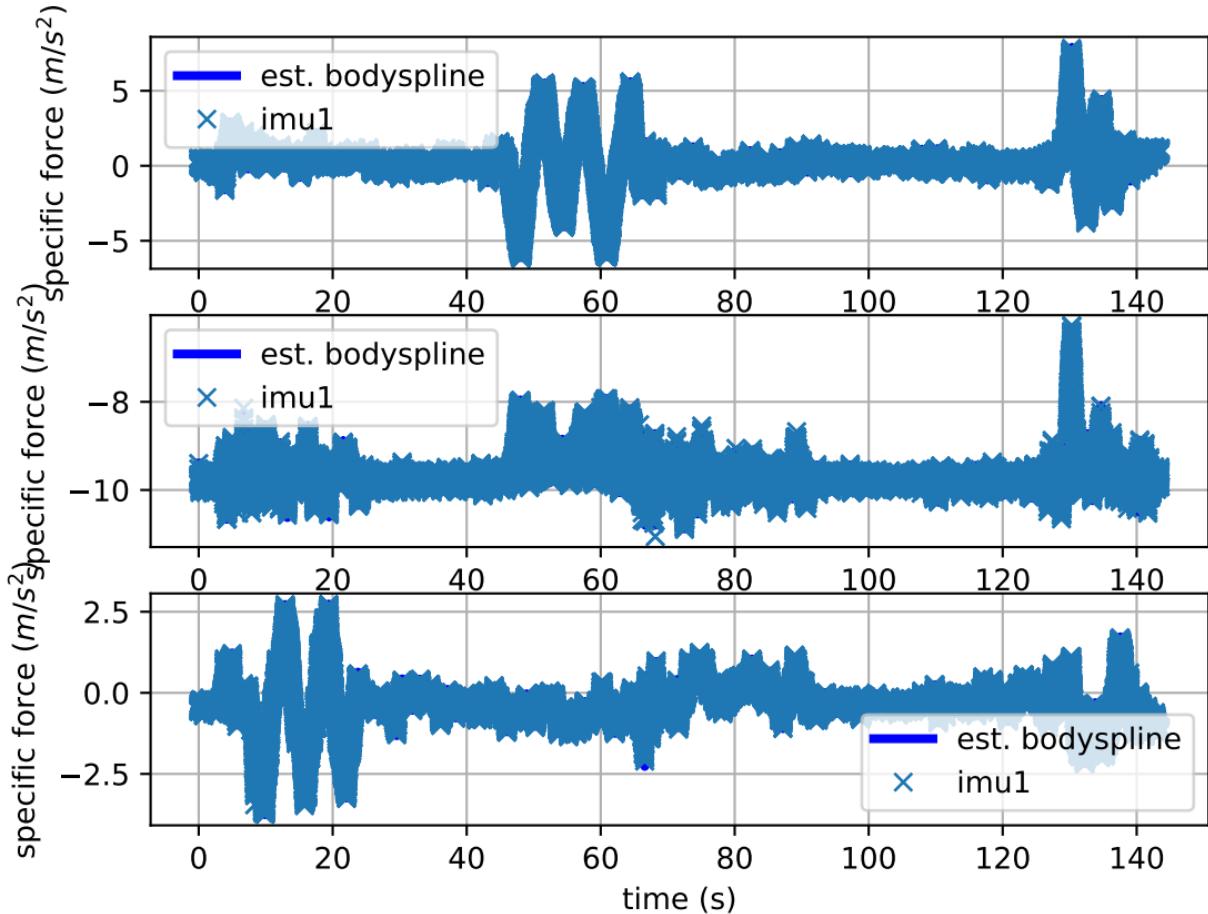
imu0: estimated gyro bias (imu frame)



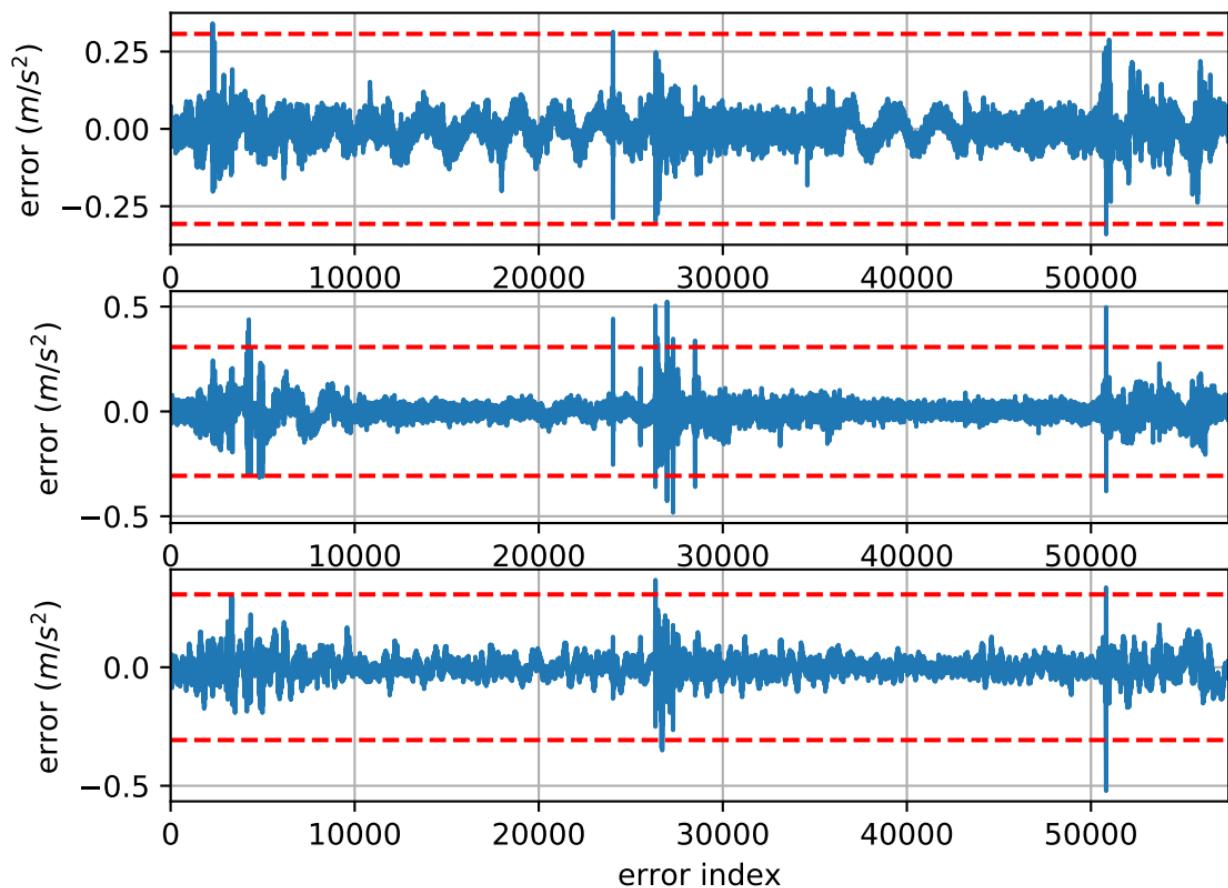
imu1: sample inertial rate



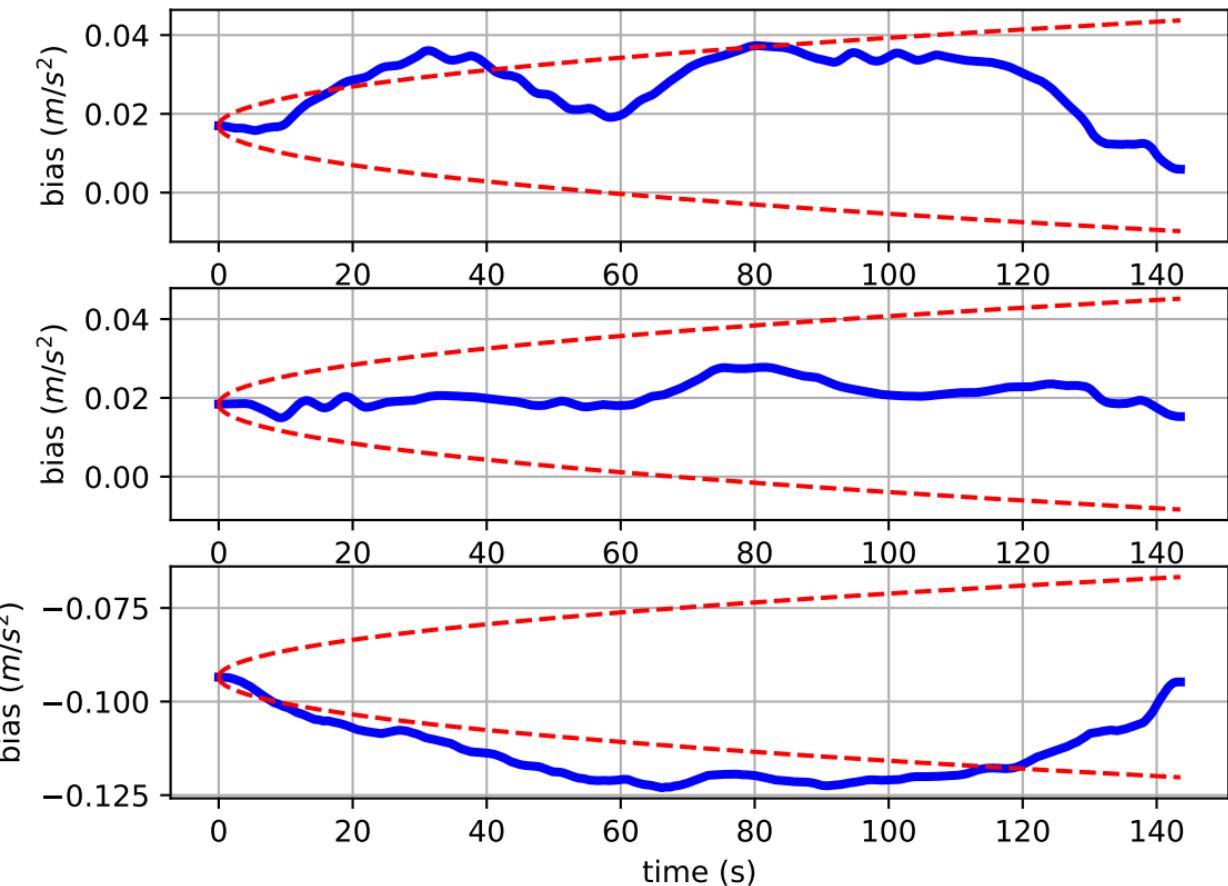
Comparison of predicted and measured specific force (imu0 frame)



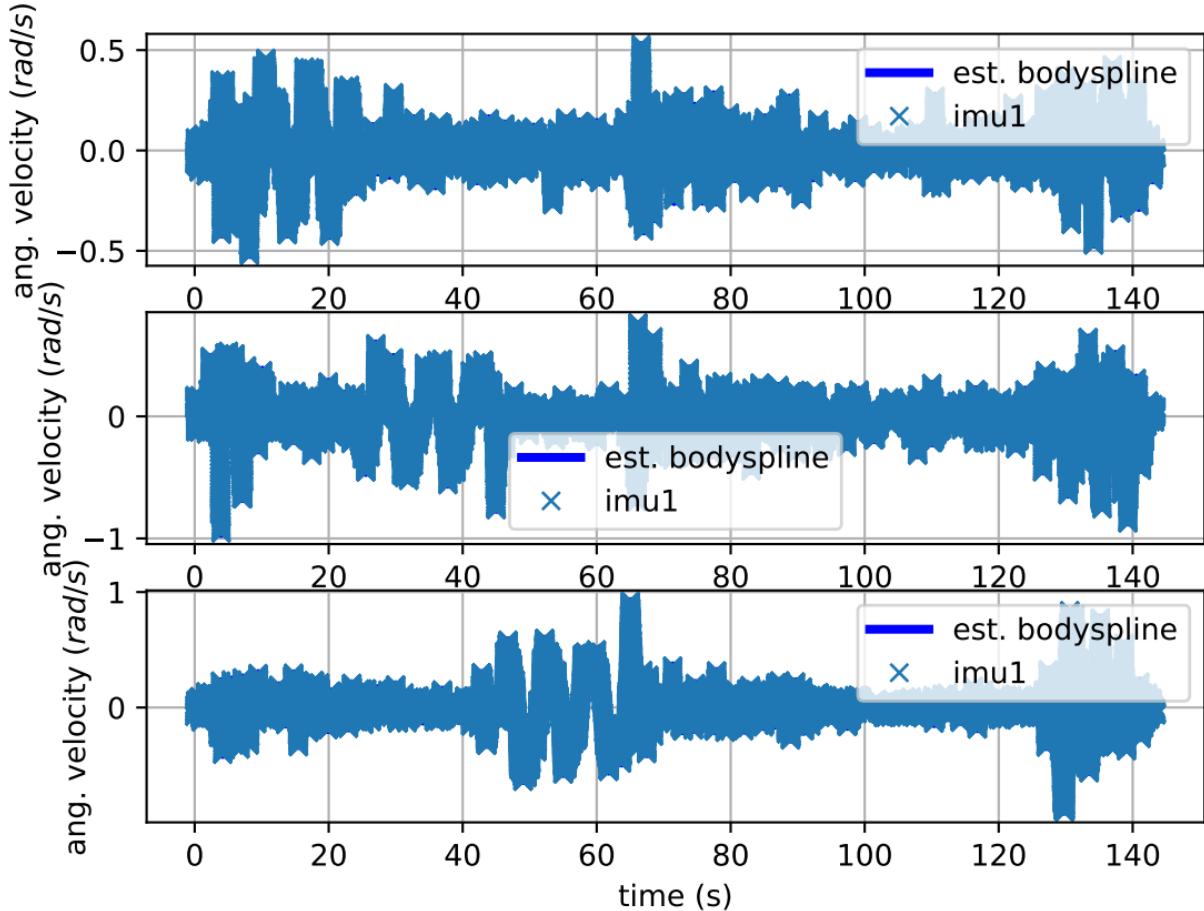
imu1: acceleration error



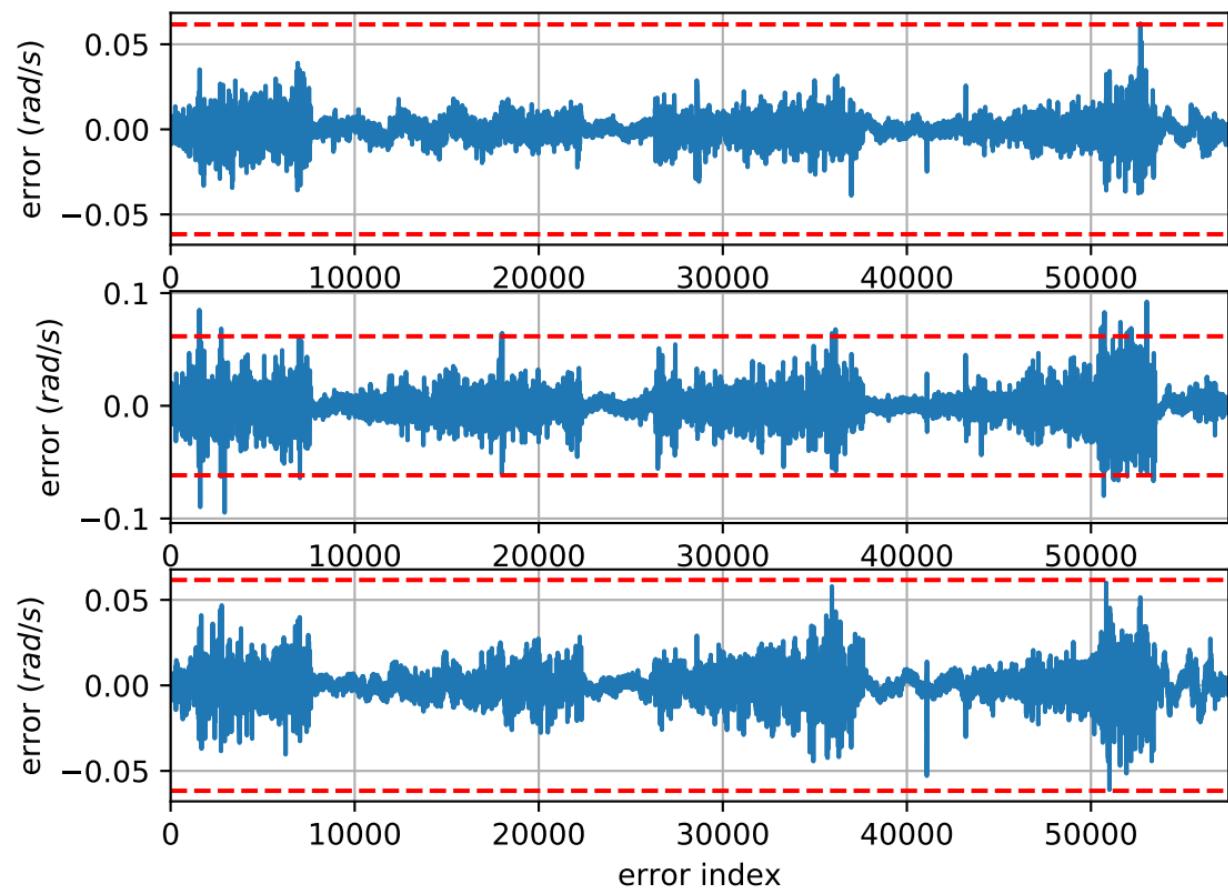
imu1: estimated accelerometer bias (imu frame)



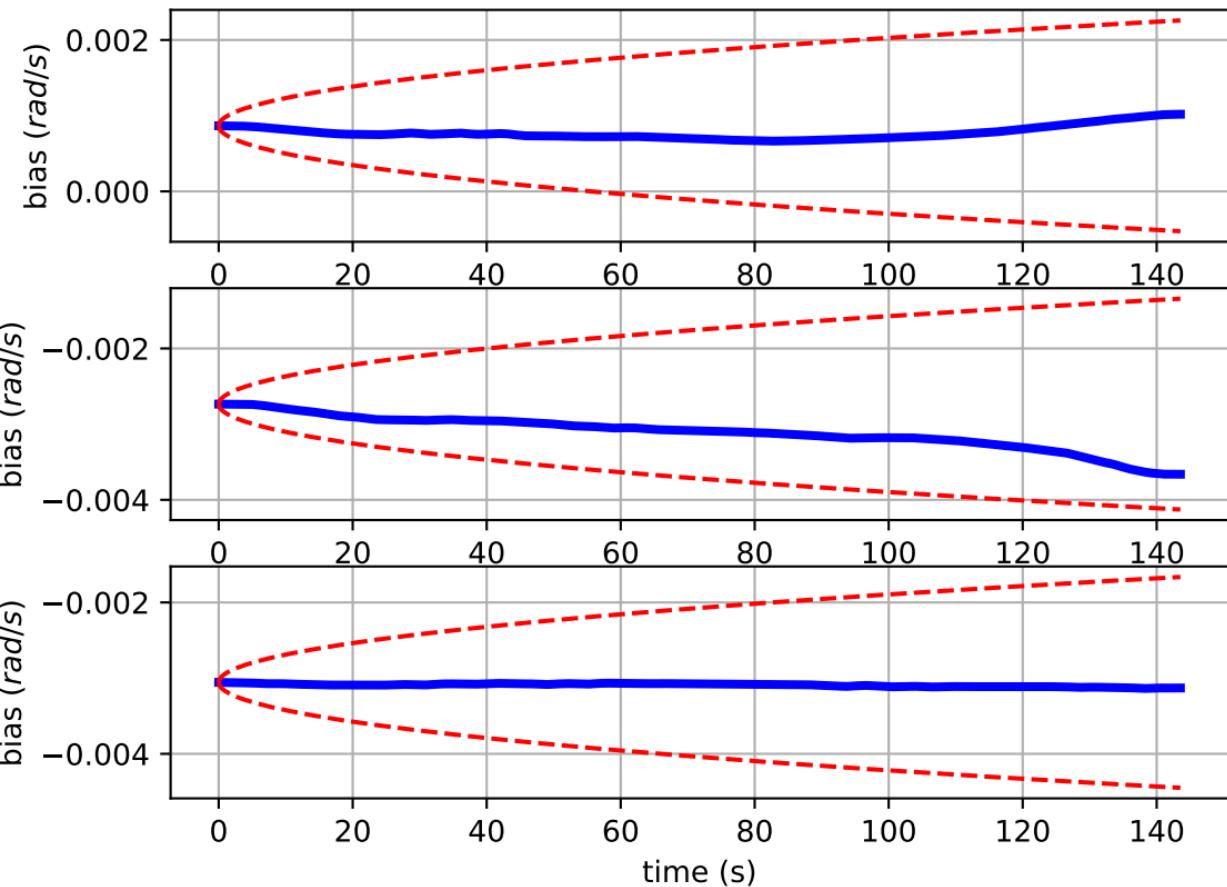
Comparison of predicted and measured angular velocities (body frame)



imu1: angular velocities error



imu1: estimated gyro bias (imu frame)



cam0: reprojection errors

