

Calibration results

Normalized Residuals

Reprojection error (cam0): mean 0.0593366987259, median 0.0554653433719, std: 0.0314537983629

Reprojection error (cam1): mean 0.061528706969, median 0.0572453496, std: 0.0329615115644

Gyroscope error (imu0): mean 0.205509655188, median 0.134353359694, std: 0.217978199786

Accelerometer error (imu0): mean 1.15055427289e-06, median 3.1174757915e-07, std: 3.09303732652e-06

Residuals

Reprojection error (cam0) [px]: mean 0.0593366987259, median 0.0554653433719, std: 0.0314537983629

Reprojection error (cam1) [px]: mean 0.061528706969, median 0.0572453496, std: 0.0329615115644

Gyroscope error (imu0) [rad/s]: mean 5.55221266604, median 3.6297974649, std: 5.88907280614

Accelerometer error (imu0) [m/s²]: mean 1.25913459927e-07, median 3.41167880904e-08, std: 3.3849340326e-07

Transformation (cam0):

T_ci: (imu0 to cam0):

```
[[-0.99988681 -0.00143553 -0.01497689 -0.04316472]
 [ 0.00152597  0.99998066  0.00602877  0.00006882]
 [ 0.01496794 -0.00605094  0.99986966 -0.0039524 ]
 [ 0.          0.          1.          ]]
```

T_ic: (cam0 to imu0):

```
[[-0.99988681  0.00152597  0.01496794  0.04321889]
 [-0.00143553  0.99998066 -0.00605094 -0.0001547 ]
 [-0.01497689  0.00602877  0.99986966  0.00330499]
 [ 0.          0.          1.          ]]
```

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

-0.027945562785725034

Transformation (cam1):

T_ci: (imu0 to cam1):
[[0.9998333 0.0003498 -0.01825517 -0.07619451]
[-0.00034366 0.99999988 0.00033917 0.00015762]
[0.01825529 -0.00033284 0.9998333 -0.00314387]
[0. 0. 0. 1.]]

T_ic: (cam1 to imu0):
[[-0.9998333 -0.00034366 0.01825529 0.07623926]
[0.0003498 0.99999988 -0.00033284 -0.00013201]
[-0.01825517 0.00033917 0.9998333 0.00175235]
[0. 0. 0. 1.]]

timeshift cam1 to imu0: [s] (t_imu = t_cam + shift)
0.02700837655457488

Baselines:

Baseline (cam0 to cam1):
[[0.99999303 0.00176545 -0.00328946 -0.03304321]
[-0.00178424 0.99998207 -0.00571696 -0.00001081]
[0.0032793 0.00572279 0.99997825 0.0009496]
[0. 0. 0. 1.]]
baseline norm: 0.03305685637752797 [m]

Gravity vector in target coords: [m/s^2]
[-0.42768471 -9.44117236 -2.61720713]

Calibration configuration

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cam0

Camera model: pinhole
Focal length: [392.6505915410682, 393.0652251186848]
Principal point: [323.29570169695376, 240.73955640915167]
Distortion model: radtan
Distortion coefficients: [0.0005563890971081716, -0.004012645765899501, -0.0014965012951977628,
2.6744109801087385e-05]
Type: aprilgrid
Tags:
Rows: 6
Cols: 6
Size: 0.022 [m]
Spacing 0.0066 [m]

cam1

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Camera model: pinhole
Focal length: [391.42985642886225, 391.83822904861637]
Principal point: [323.9753732436904, 241.07201705086968]
Distortion model: radtan
Distortion coefficients: [0.0021892529264270315, -0.008937990910494836, -0.0007958179543301612,
-0.00033049318175582486]
Type: aprilgrid
Tags:
Rows: 6
Cols: 6
Size: 0.022 [m]
Spacing 0.0066 [m]

IMU configuration

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IMU0:

Model: calibrated
Update rate: 200.0

Accelerometer:

Noise density: 0.00773837996651

Noise density (discrete): 0.109437218994

Random walk: 0.000120730219363

Gyroscope:

Noise density: 1.91037604688

Noise density (discrete): 27.0167971473

Random walk: 0.00323300681388

T_{ib} (imu0 to imu0)

$\begin{bmatrix} 1. & 0. & 0. & 0. \end{bmatrix}$

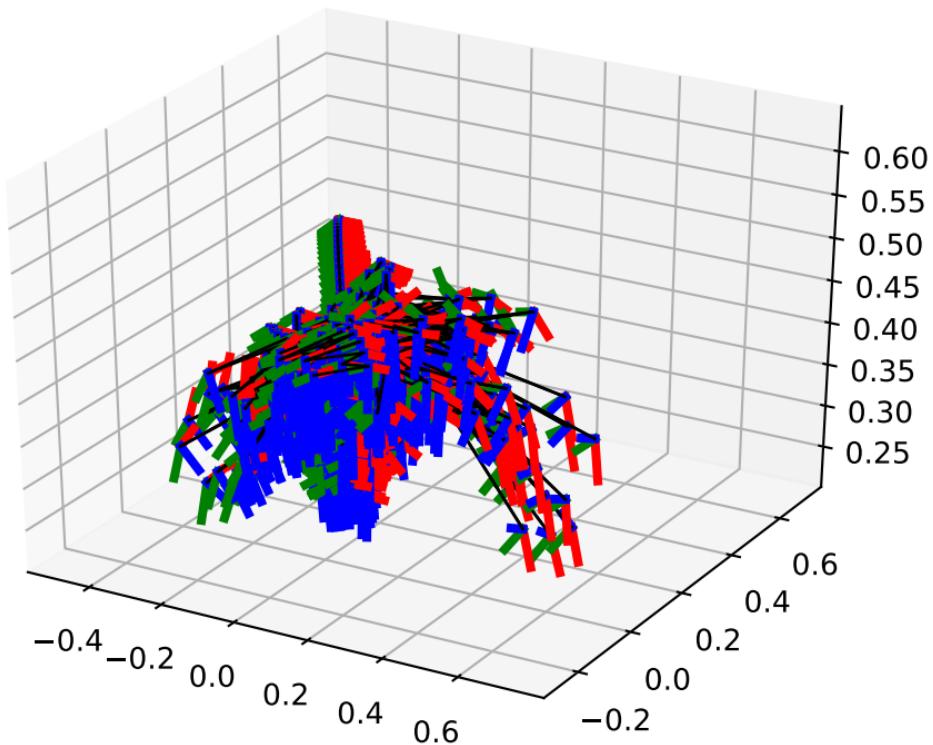
$\begin{bmatrix} 0. & 1. & 0. & 0. \end{bmatrix}$

$\begin{bmatrix} 0. & 0. & 1. & 0. \end{bmatrix}$

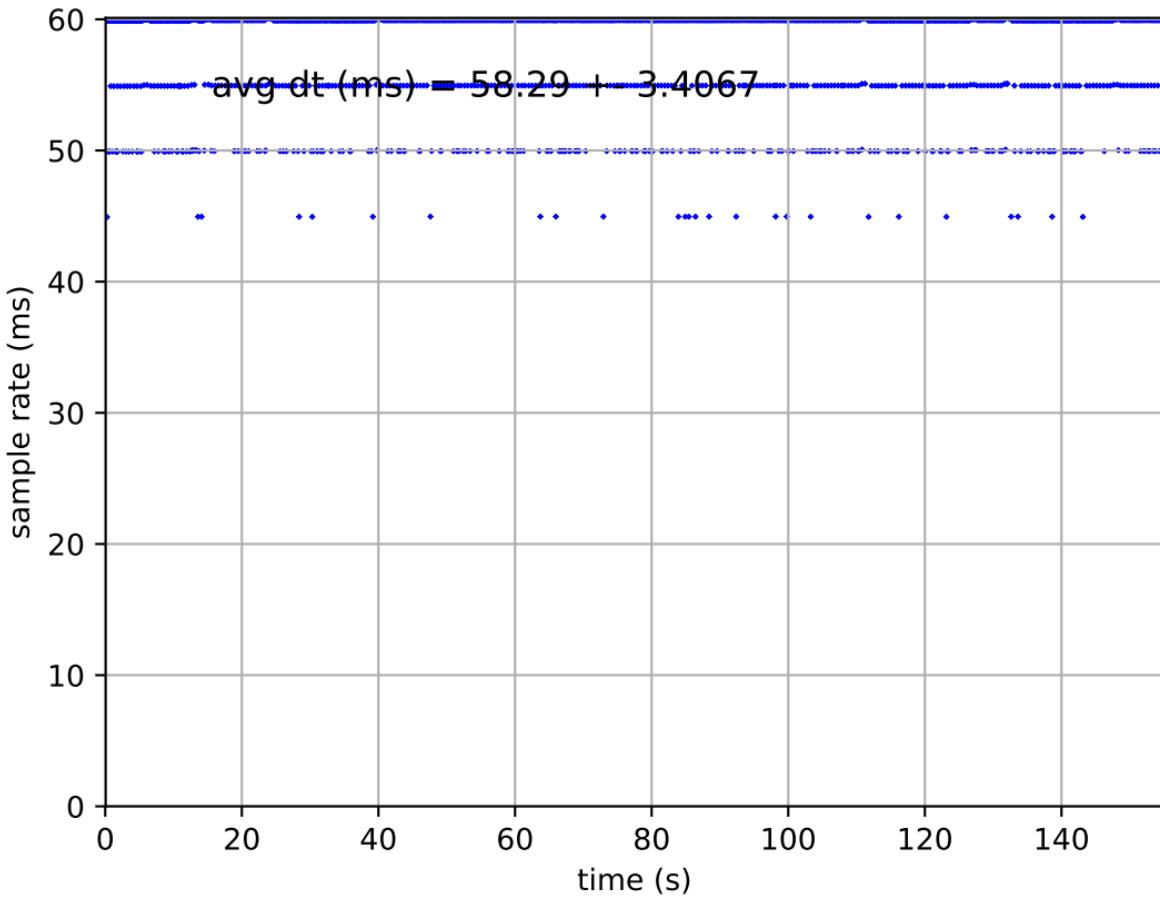
$\begin{bmatrix} 0. & 0. & 0. & 1. \end{bmatrix}$

time offset with respect to IMU0: 0.0 [s]

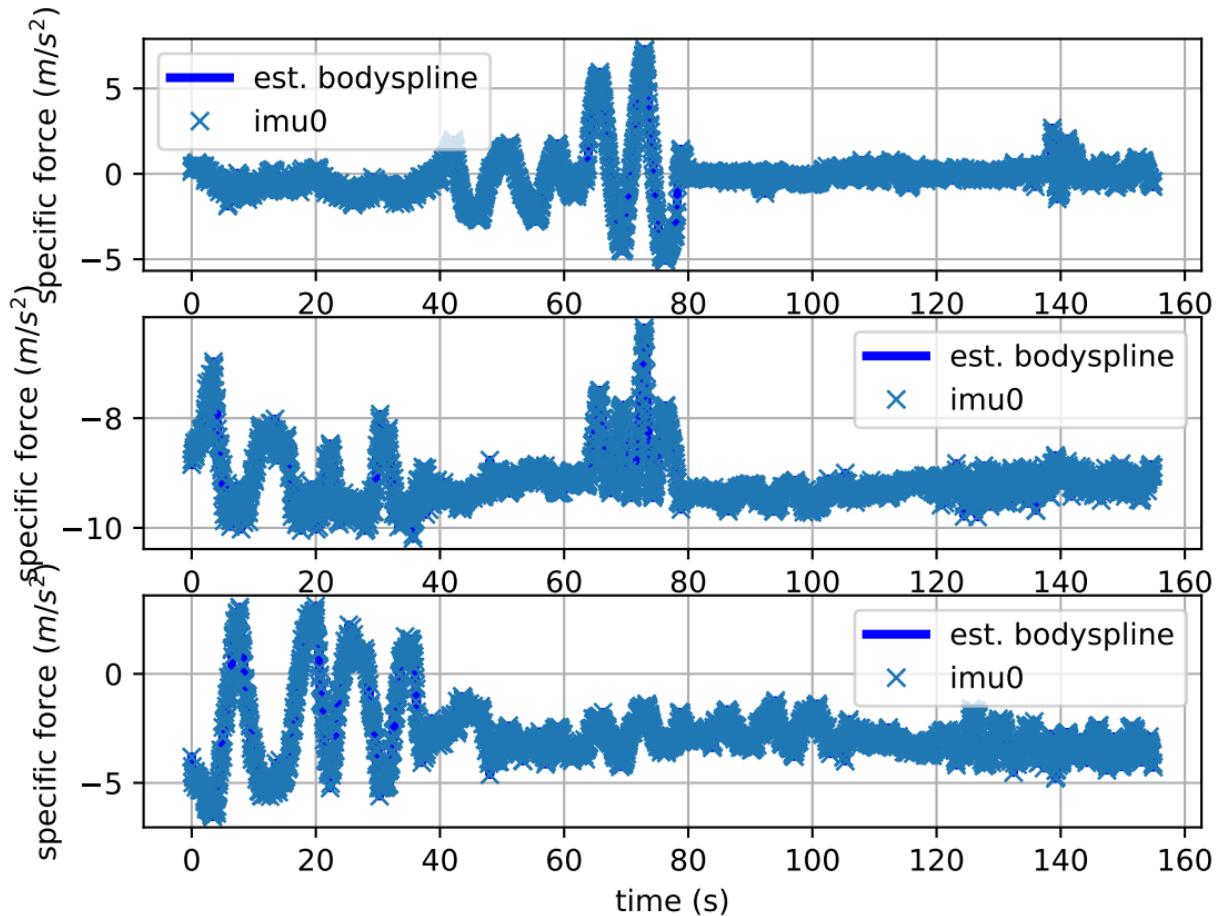
imu0: estimated poses



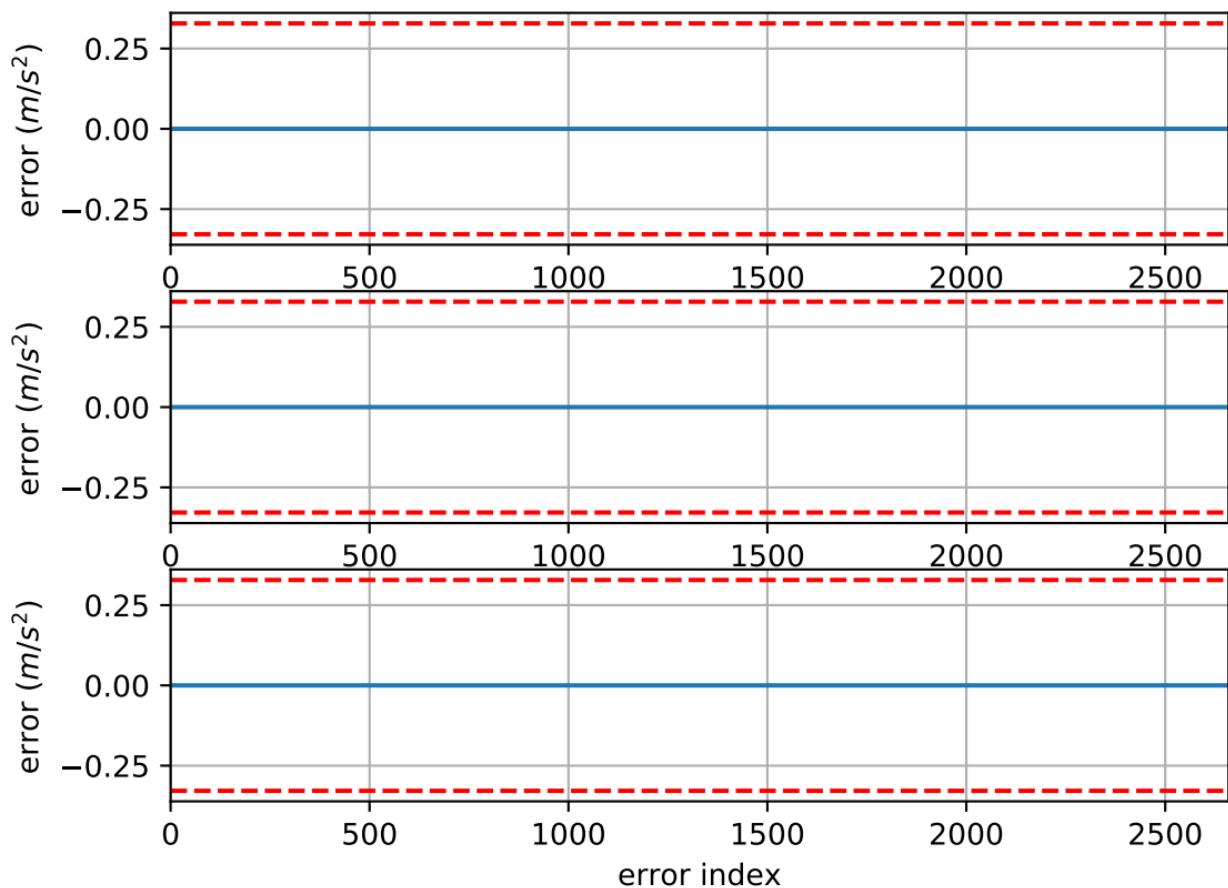
imu0: sample inertial rate



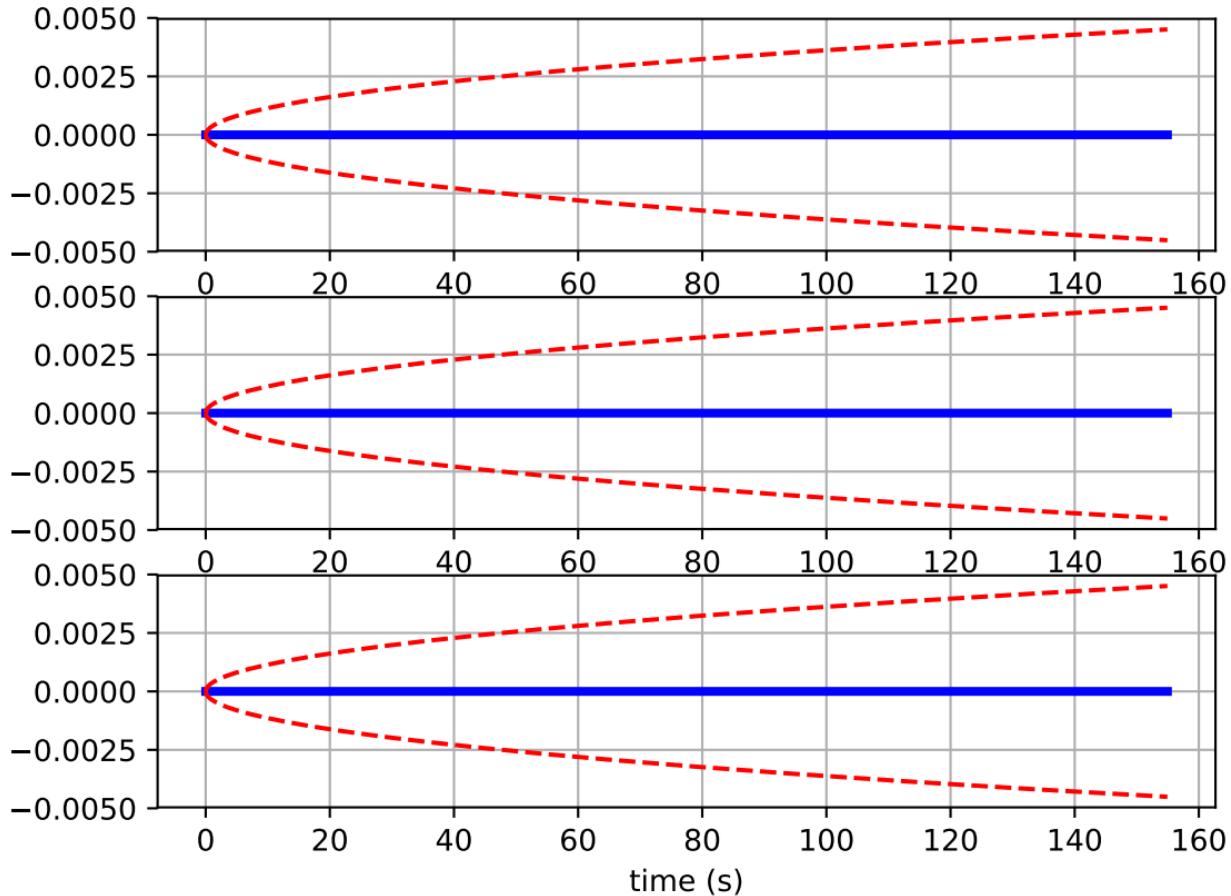
Comparison of predicted and measured specific force (imu0 frame)



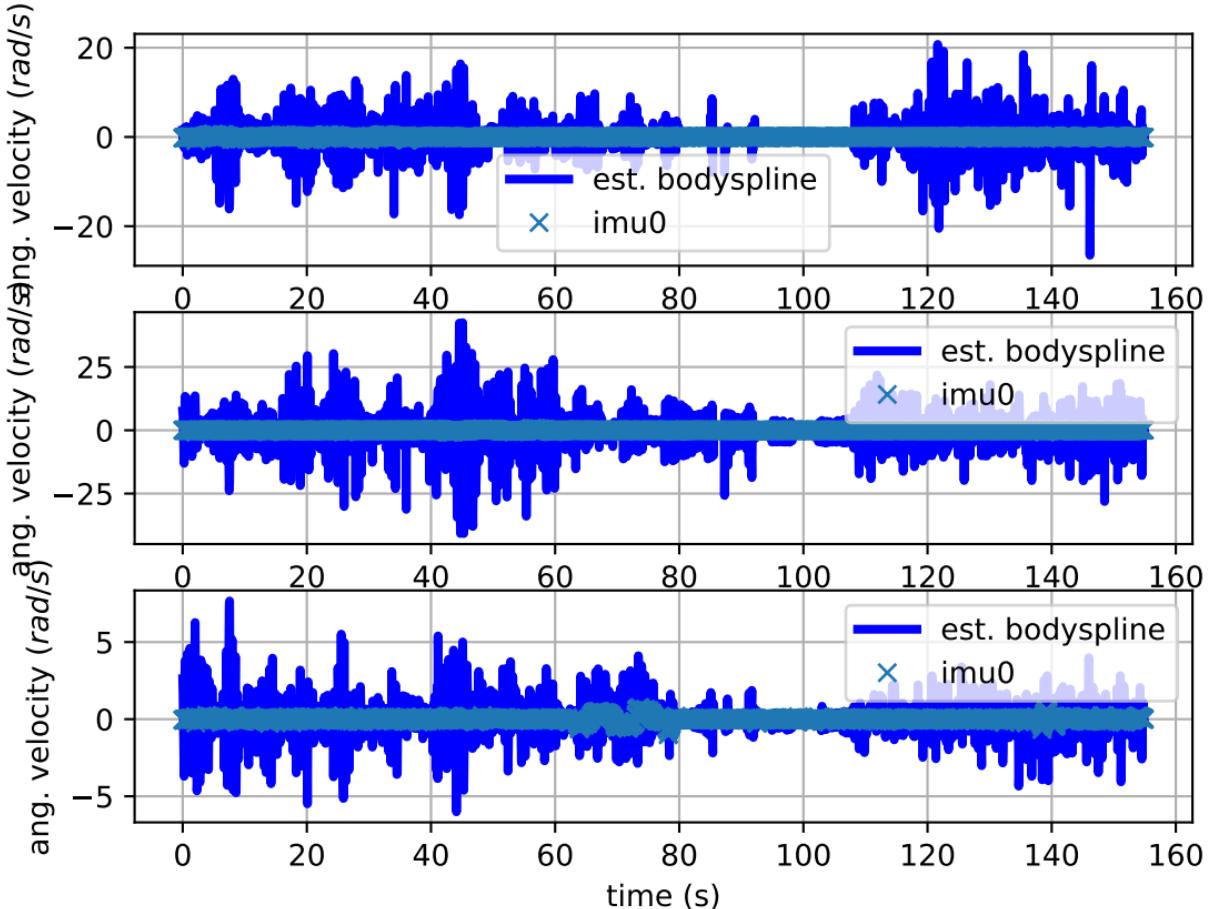
imu0: acceleration error



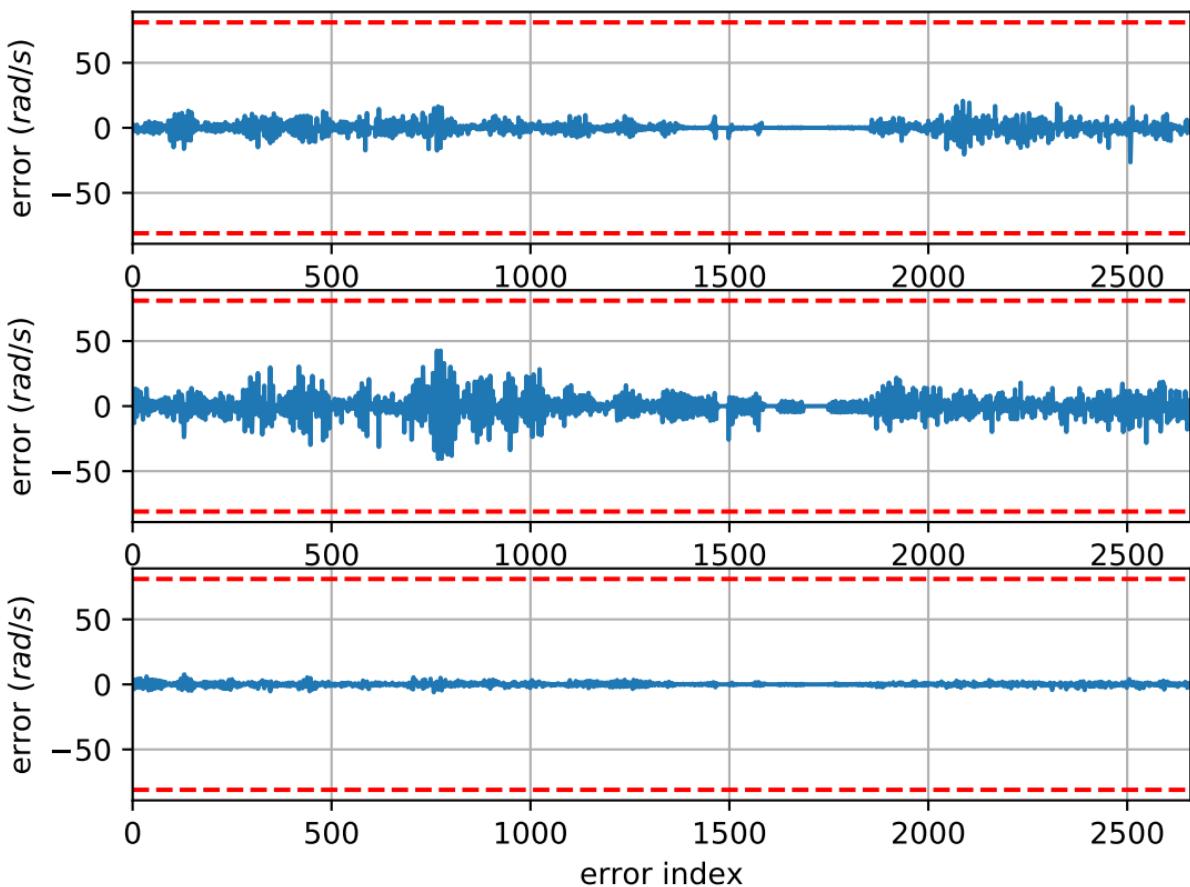
imu0: estimated accelerometer bias (imu frame)



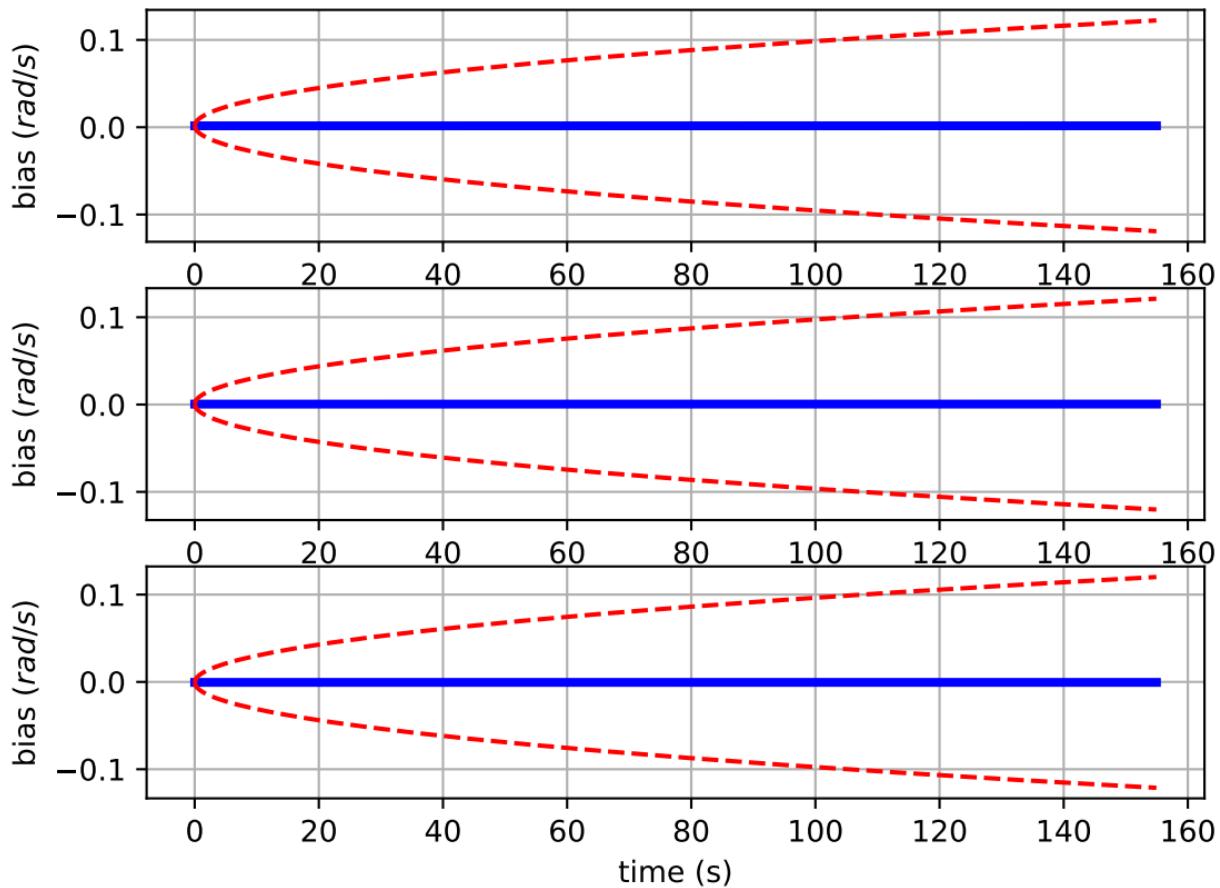
Comparison of predicted and measured angular velocities (body frame)



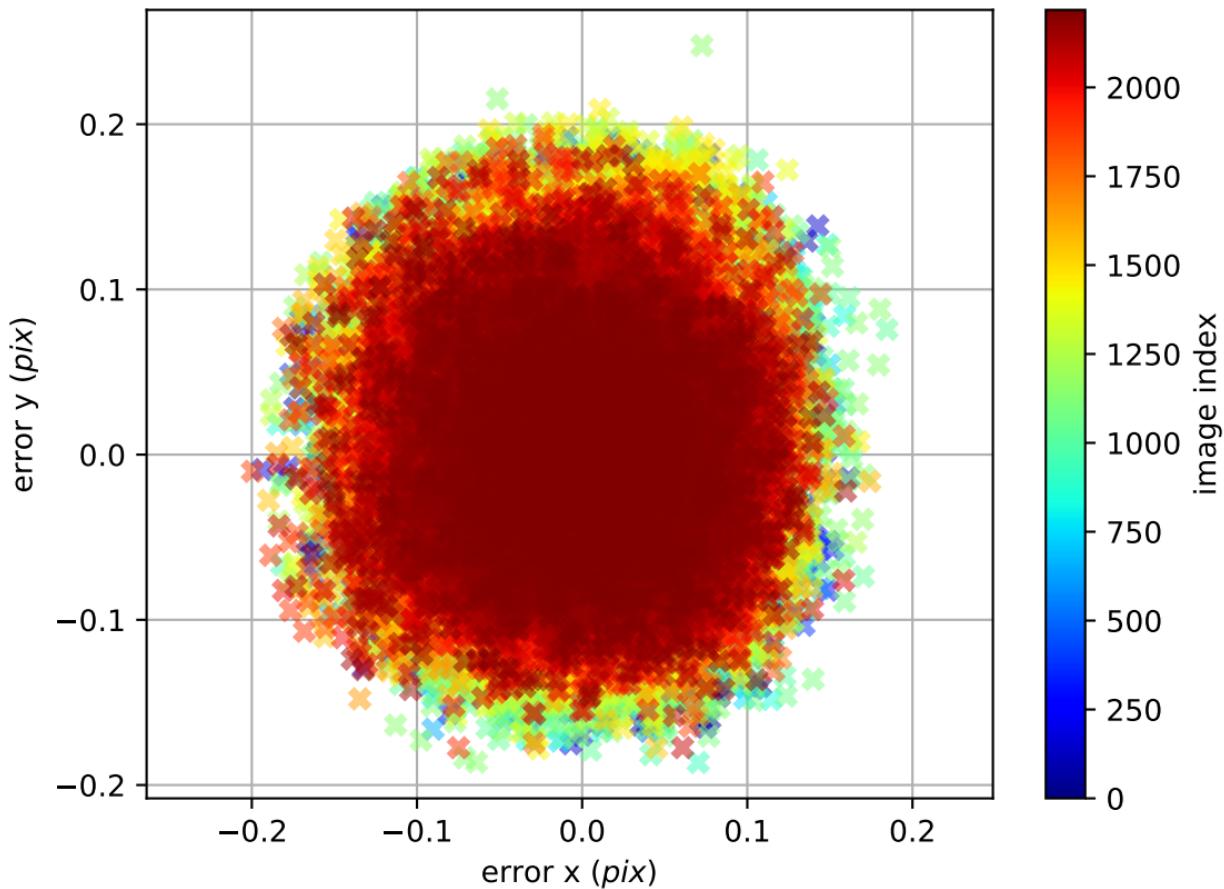
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

