

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 0.1547431454631043, median 0.14237846202697635, std: 0.08589818
Reprojection error (cam1): mean 0.14760752068332753, median 0.13425612029748898, std: 0.0842305
Gyroscope error (imu0): mean 0.0003171943875061913, median 2.106229056871552e-06, std: 0.0012
Accelerometer error (imu0): mean 0.00011347888224204977, median 0.00011092949555601415, std: 6.7

Residuals

Reprojection error (cam0) [px]: mean 0.1547431454631043, median 0.14237846202697635, std: 0.08589
Reprojection error (cam1) [px]: mean 0.14760752068332753, median 0.13425612029748898, std: 0.0842
Gyroscope error (imu0) [rad/s]: mean 1.1540522708900845e-05, median 7.663119279025235e-08, std: 4
Accelerometer error (imu0) [m/s^2]: mean 3.262971277522221e-05, median 3.1896662240402145e-05, std: 6.7

Transformation (cam0):

T_ci: (imu0 to cam0):

```
[[ -0.99970992  0.02407255  0.00077113 -0.00124521]
 [ -0.02401177 -0.99865671  0.04591526  0.00069034]
 [  0.00187539  0.04588343  0.99894504 -0.00162246]
 [  0.          0.          0.          1.        ]]
```

T_ic: (cam0 to imu0):

```
[[ -0.99970992 -0.02401177  0.00187539 -0.00122523]
 [  0.02407255 -0.99865671  0.04588343  0.00079383]
 [  0.00077113  0.04591526  0.99894504  0.00159001]
 [  0.          0.          0.          1.        ]]
```

timeshift cam0 to imu0: [s] (t_imu = t_cam + shift)
-0.0010001456112559057

Transformation (cam1):

T_ci: (imu0 to cam1):

```
[ 0.      0.      0.      1.    ]]
```

T_ic: (cam1 to imu0):

```
[[-0.99971383 -0.02340265 -0.00495803 -0.06501711]  
[ 0.02313775 -0.998577  0.04804811 0.00159875]  
[-0.00607543 0.04791964 0.99883272 0.00114303]  
[ 0.      0.      0.      1.    ]]
```

timeshift cam1 to imu0: [s] ($t_{imu} = t_{cam} + \text{shift}$)

0.004523984571216704

Baselines:

Baseline (cam0 to cam1):

```
[[ 0.99997613 0.00061928 -0.00688223 -0.06379496]  
[-0.00060548 0.9999978  0.00200707 -0.00066771]  
[ 0.00688346 -0.00200285 0.9999743  0.0000915 ]  
[ 0.      0.      0.      1.    ]]
```

baseline norm: 0.06379852042233992 [m]

Gravity vector in target coords: [m/s²]

```
[ 9.77571925 0.37776954 -0.67898909]
```

Calibration configuration

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cam0

Camera model: omni

Focal length: [840.3541786270555, 841.7395501100224]

Principal point: [426.05865129442844, 400.00487827975144]

Omni xi: 2.001096742981025

Distortion model: radtan

Distortion coefficients: [0.26251514138713067, -0.8542295909903589, 0.005012383463787277, 0.000396

Type: aprilgrid

Size: 0.042 [m]
Spacing 0.0126 [m]

cam1

Camera model: omni
Focal length: [858.0616614592365, 859.2884312738671]
Principal point: [420.5531333881858, 399.5995298375353]
Omni xi: 2.0685299301598383
Distortion model: radtan
Distortion coefficients: [0.3057722348408115, -0.9001536527726495, 0.004399425529691084, -0.002478
Type: aprilgrid
Tags:
Rows: 6
Cols: 6
Size: 0.042 [m]
Spacing 0.0126 [m]

IMU configuration

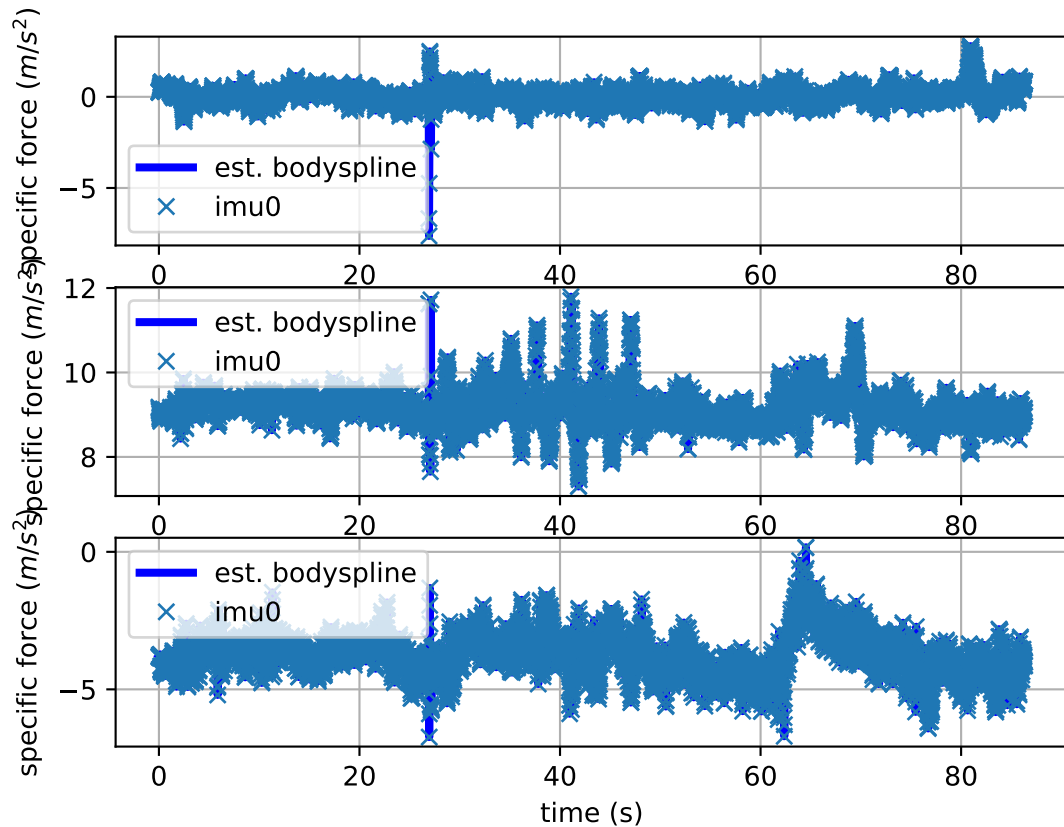
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IMU0:

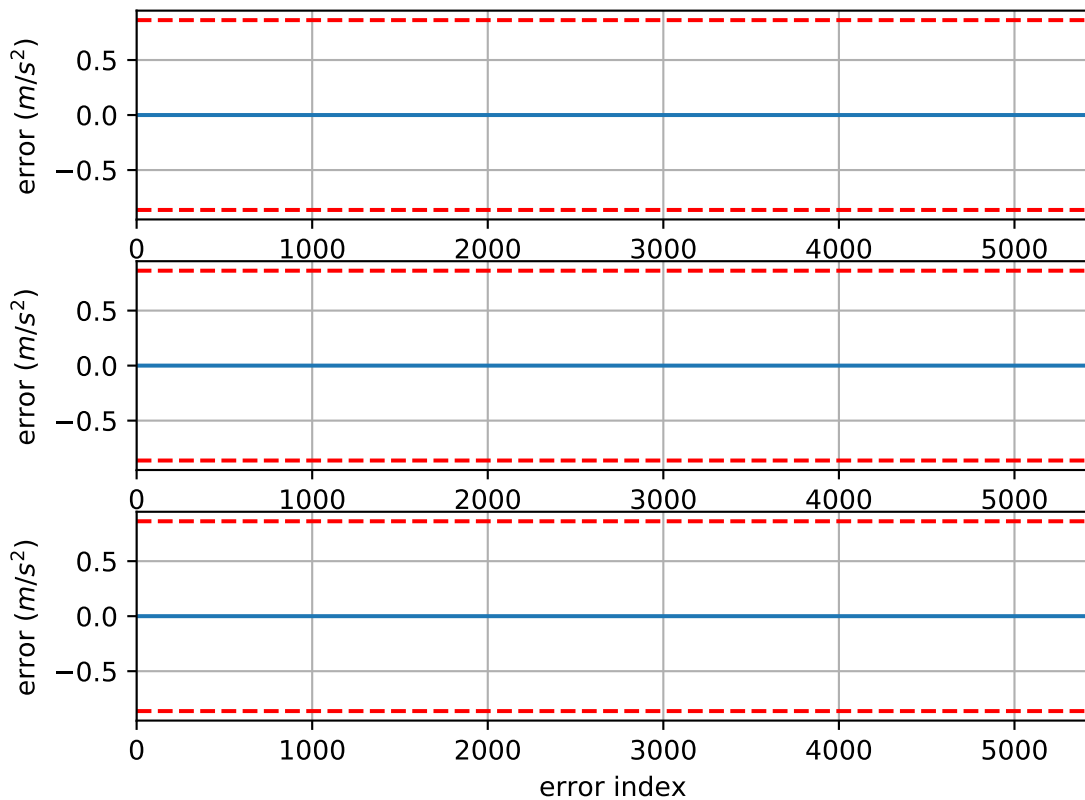
Model: calibrated
Update rate: 200.0
Accelerometer:
Noise density: 0.020332145255286385
Noise density (discrete): 0.2875399557216578
Random walk: 0.0007625696411853556
Gyroscope:
Noise density: 0.0025726753648003466
Noise density (discrete): 0.036383123924838
Random walk: 4.170175142175555e-05
T_ib (imu0 to imu0)
[1. 0. 0. 0.]

time offset with respect to IMU0: 0.0 [s]

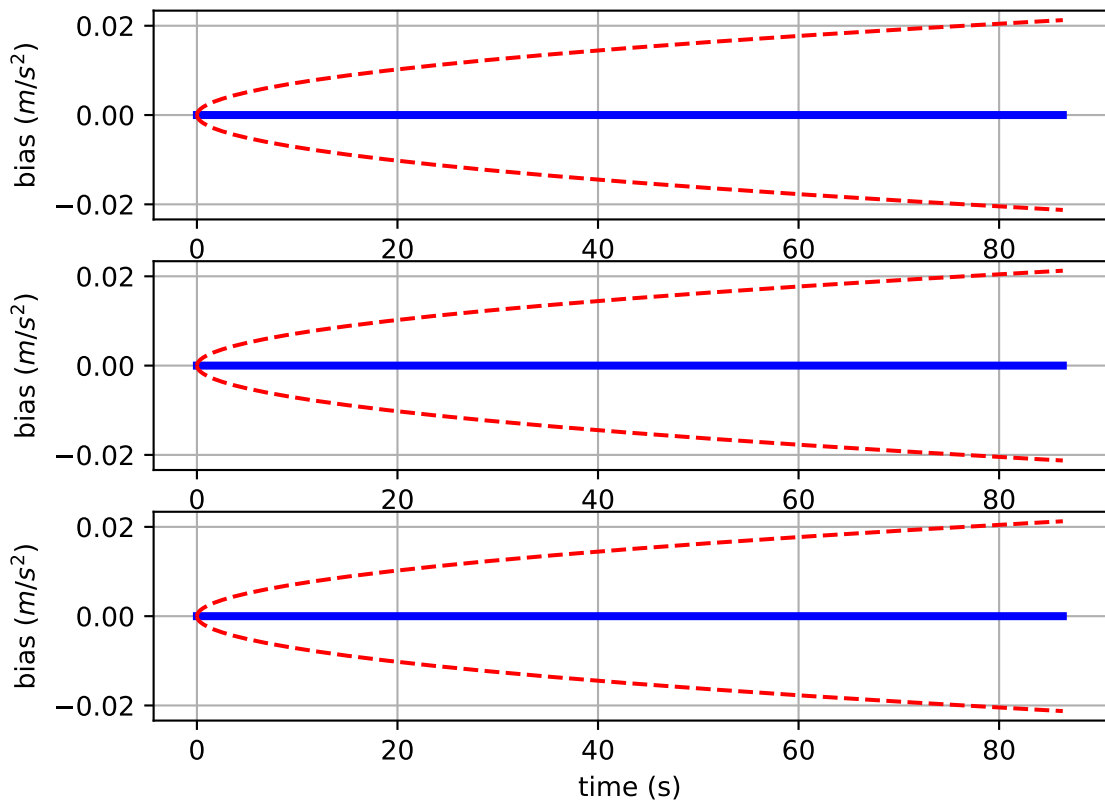
Comparison of predicted and measured specific force (imu0 frame)



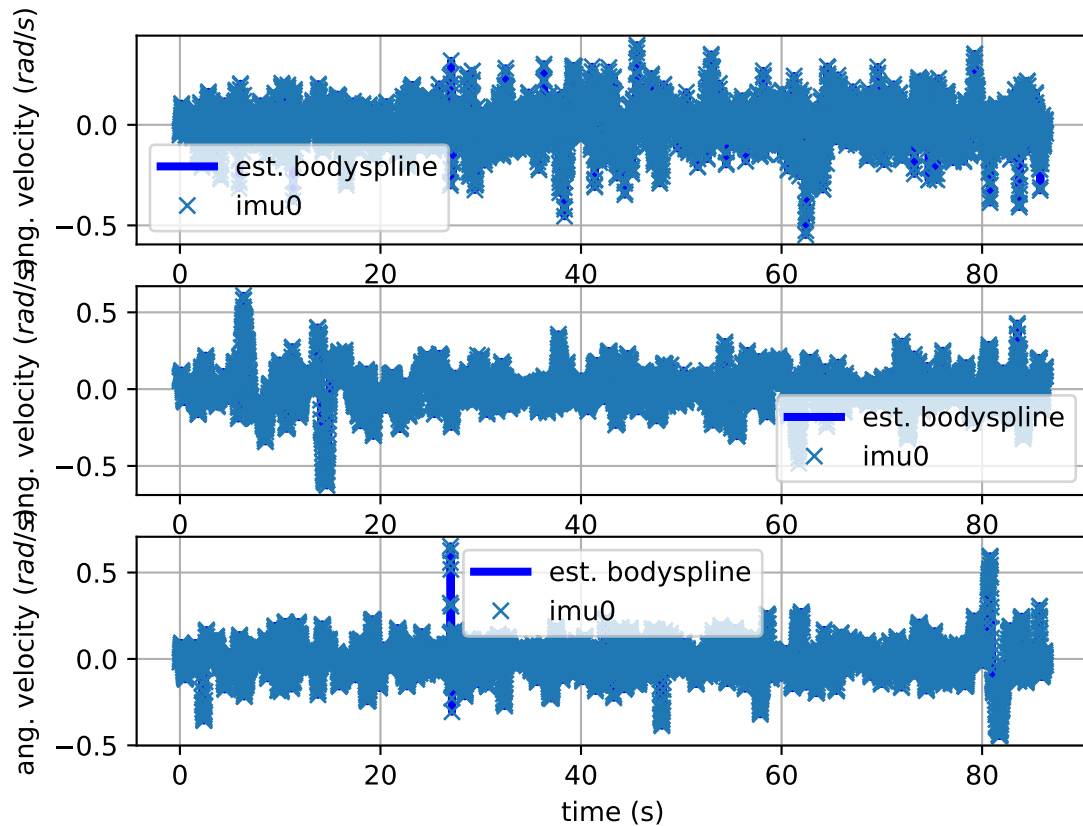
imu0: acceleration error



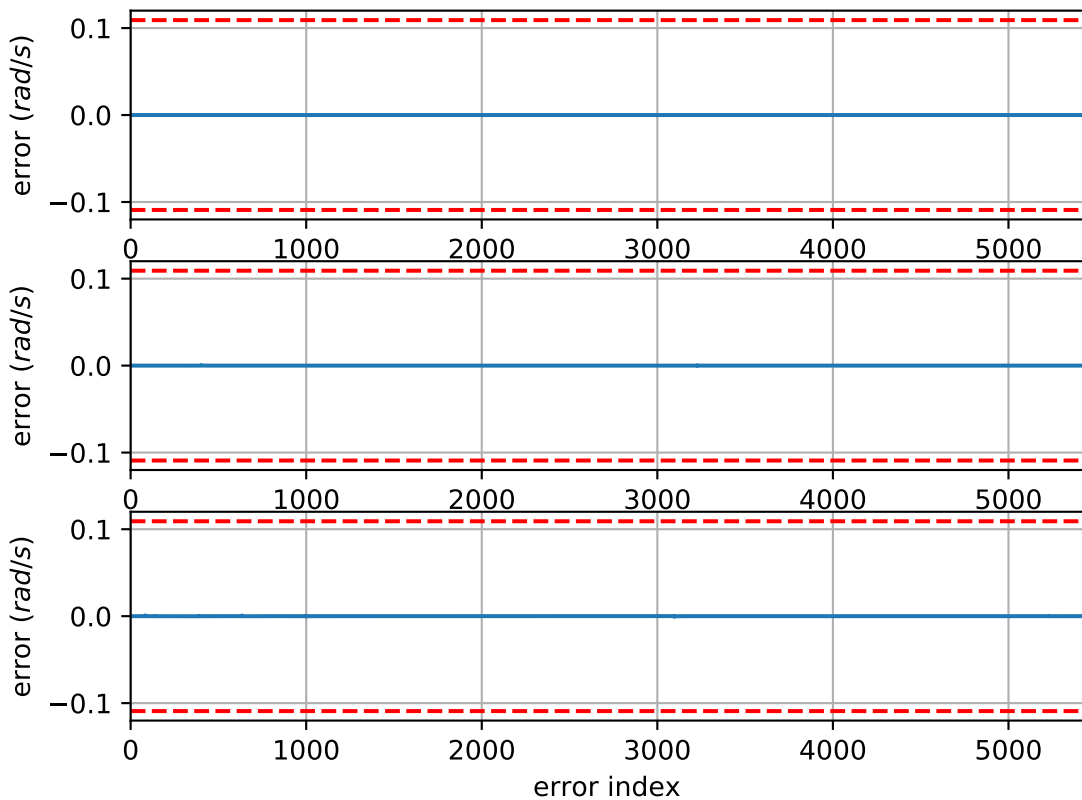
imu0: estimated accelerometer bias (imu frame)



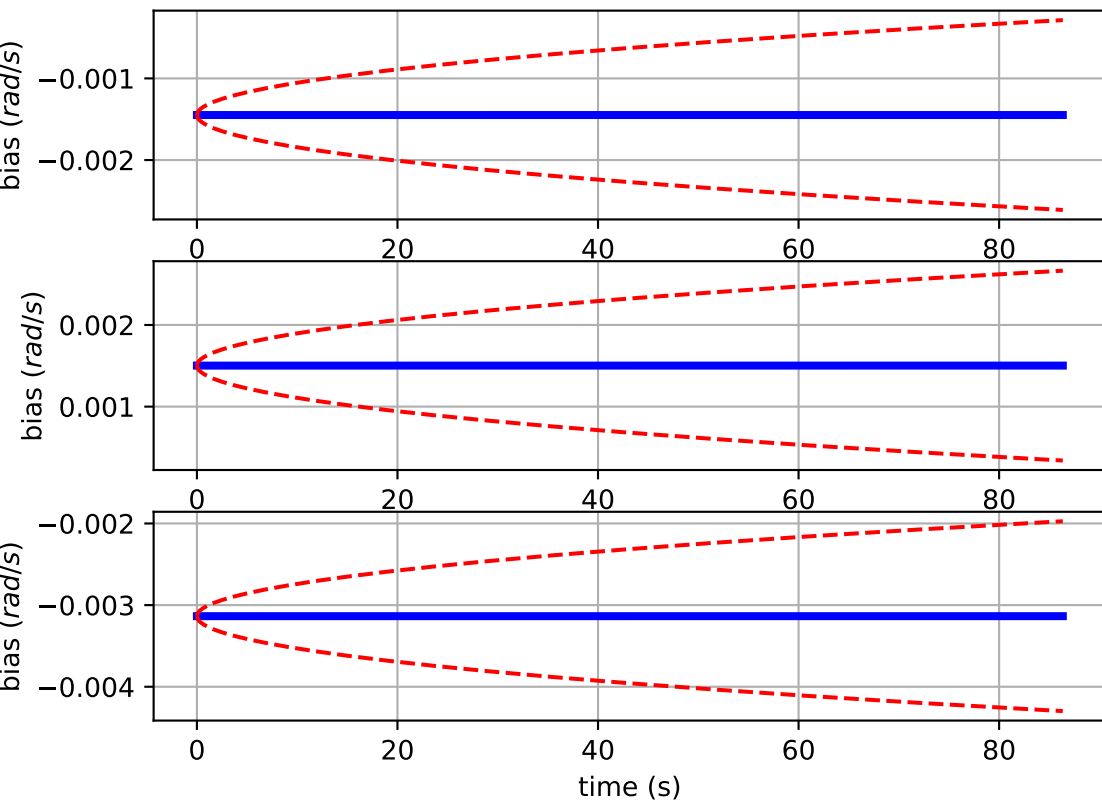
Comparison of predicted and measured angular velocities (body frame)



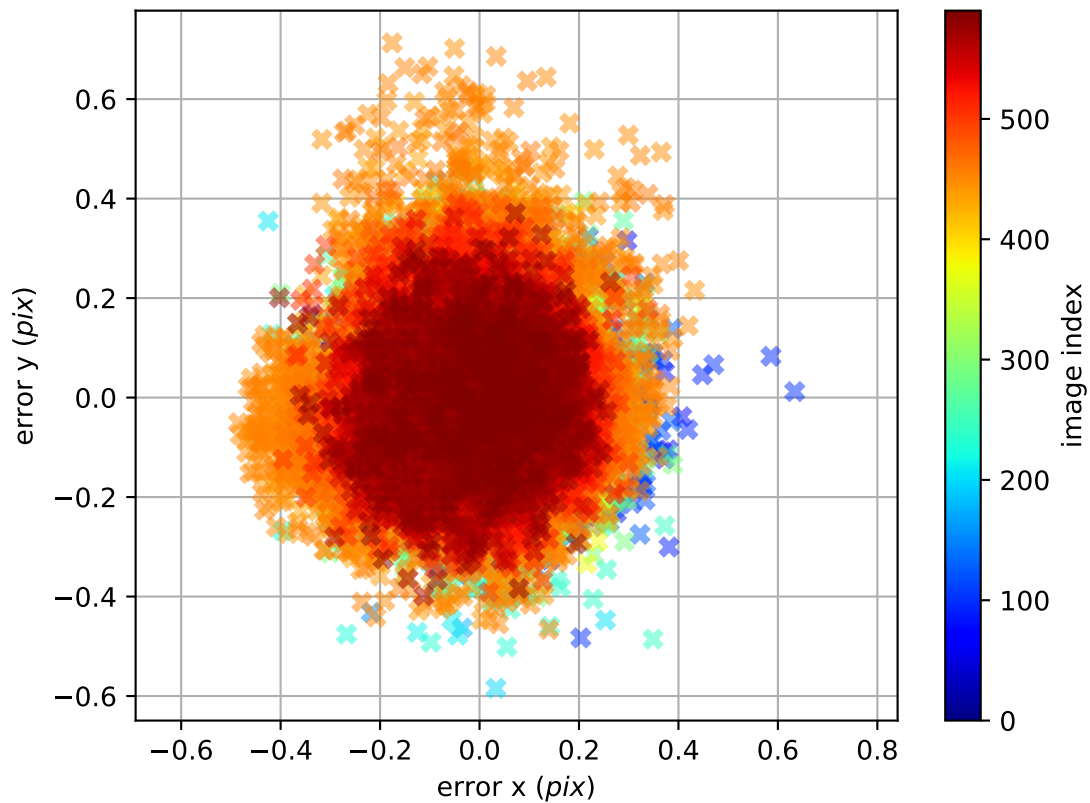
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

