

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 1.00673837351, median 1.02668679013, std: 0.489568952734
Reprojection error (cam1): mean 1.22895363385, median 1.2857629555, std: 0.526257340431
Gyroscope error (imu0): mean 0.0198118811499, median 0.0161077165831, std: 0.0146338708181
Accelerometer error (imu0): mean 0.0467863651063, median 0.0383644890693, std: 0.0320204312019

Residuals

Reprojection error (cam0) [px]: mean 1.00673837351, median 1.02668679013, std: 0.489568952734
Reprojection error (cam1) [px]: mean 1.22895363385, median 1.2857629555, std: 0.526257340431
Gyroscope error (imu0) [rad/s]: mean 0.0221503565066, median 0.0180089746211, std: 0.016361164961
Accelerometer error (imu0) [m/s^2]: mean 0.104617492798, median 0.085785605481, std: 0.07159986083

Transformation (cam0):

T_ci: (imu0 to cam0):

```
[[ -0.02725669 -0.99962606  0.00219194  0.02422853]
 [ -0.71392061  0.01793147 -0.69999702  0.00897443]
 [  0.69969596 -0.02064447 -0.7141424  -0.00063897]
 [  0.          0.          0.          1.         ]]
```

T_ic: (cam0 to imu0):

```
[[ -0.02725669 -0.71392061  0.69969596  0.00751451]
 [ -0.99962606  0.01793147 -0.02064447  0.02404535]
 [  0.00219194 -0.69999702 -0.7141424  0.00577265]
 [  0.          0.          0.          1.         ]]
```

timeshift cam0 to imu0: [s] ($t_{imu} = t_{cam} + \text{shift}$)
-0.0148488882666

Transformation (cam1):

T_ci: (imu0 to cam1):

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

T_ic: (cam1 to imu0):

```
[[-0.01749277 -0.7090992  0.70489172  0.00670958]  
[-0.99979146  0.01983523 -0.00485745 -0.05587358]  
[-0.01053728 -0.70482969 -0.7092983  0.00423116]  
[ 0.      0.      0.      1.    ]]
```

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

-0.0149507360078

Baselines:

Baseline (cam0 to cam1):

```
[[ 0.9998713  0.00193678  0.01592566 -0.07993259]  
[-0.00204506  0.99997489  0.00678544 -0.00007205]  
[-0.01591212 -0.00681714  0.99985015 -0.00091419]  
[ 0.      0.      0.      1.    ]]
```

baseline norm: 0.079937851782 [m]

Gravity vector in target coords: [m/s²]

[-0.04260891 0.04386309 -9.80635934]

Calibration configuration

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cam0

Camera model: pinhole

Focal length: [275.46015578667294, 274.9948095922592]

Principal point: [315.958384100568, 242.7123497822731]

Distortion model: equidistant

Distortion coefficients: [-6.545154718304953e-06, -0.010379525898159981, 0.014935312423953146, -0.0

Type: aprilgrid

Tags:

Spacing 0.015 [m]

cam1

Camera model: pinhole

Focal length: [274.4628309070672, 273.9261674470783]

Principal point: [315.93654481793794, 235.779167375461]

Distortion model: equidistant

Distortion coefficients: [-0.012138050918285051, 0.02244029339184358, -0.013753165428754275, 0.002

Type: aprilgrid

Tags:

Rows: 4

Cols: 5

Size: 0.075 [m]

Spacing 0.015 [m]

IMU configuration

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IMU0:

Model: calibrated

Update rate: 500.0

Accelerometer:

Noise density: 0.1

Noise density (discrete): 2.2360679775

Random walk: 0.002

Gyroscope:

Noise density: 0.05

Noise density (discrete): 1.11803398875

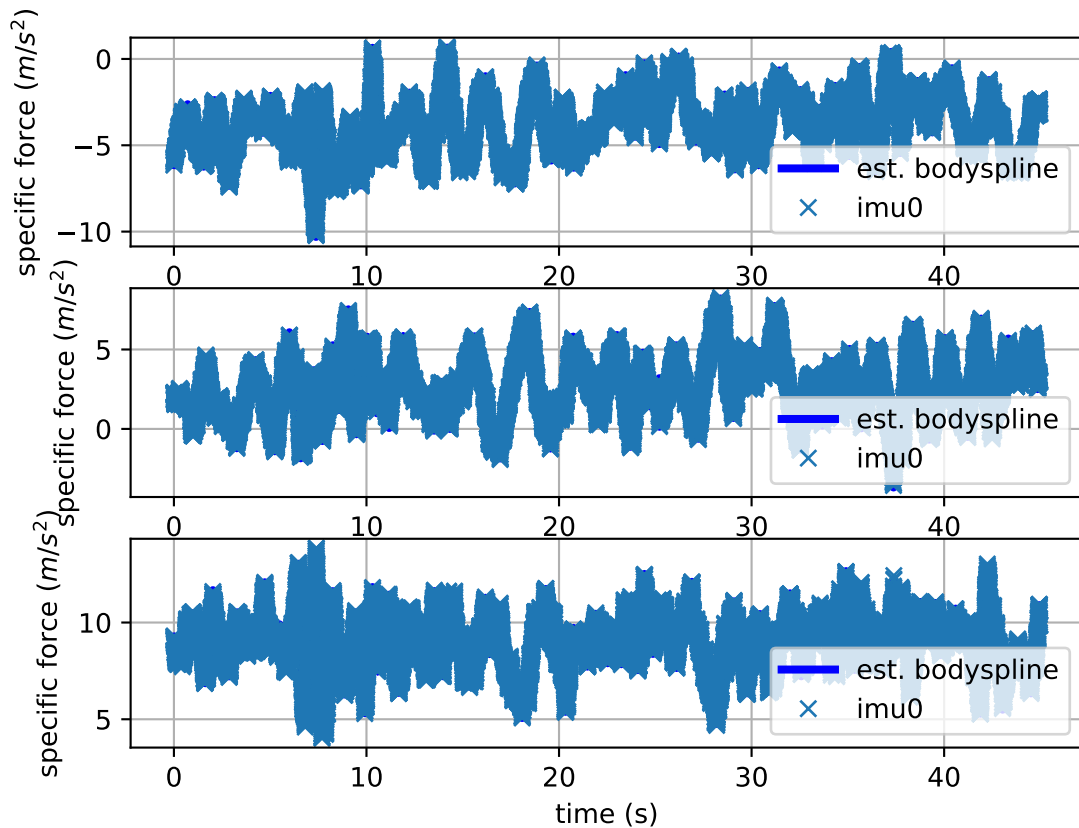
Random walk: 4e-05

T_i_b

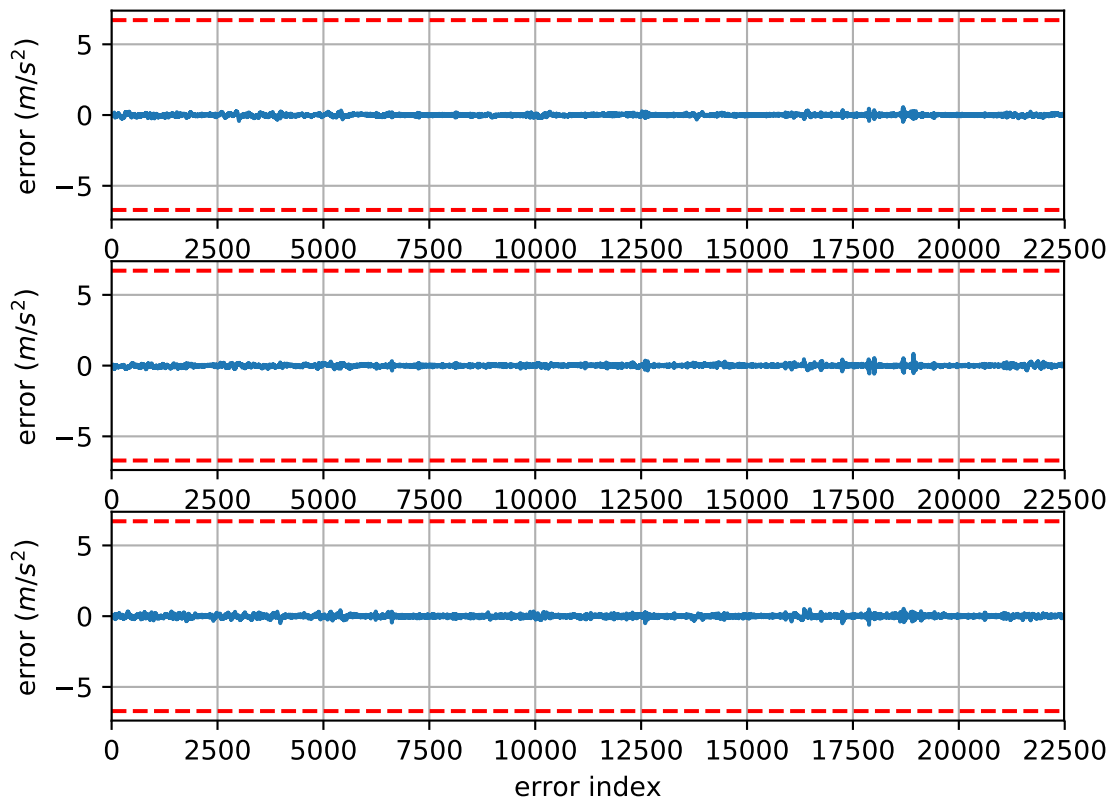
[[1. 0. 0. 0.]

[0. 1. 0. 0.]

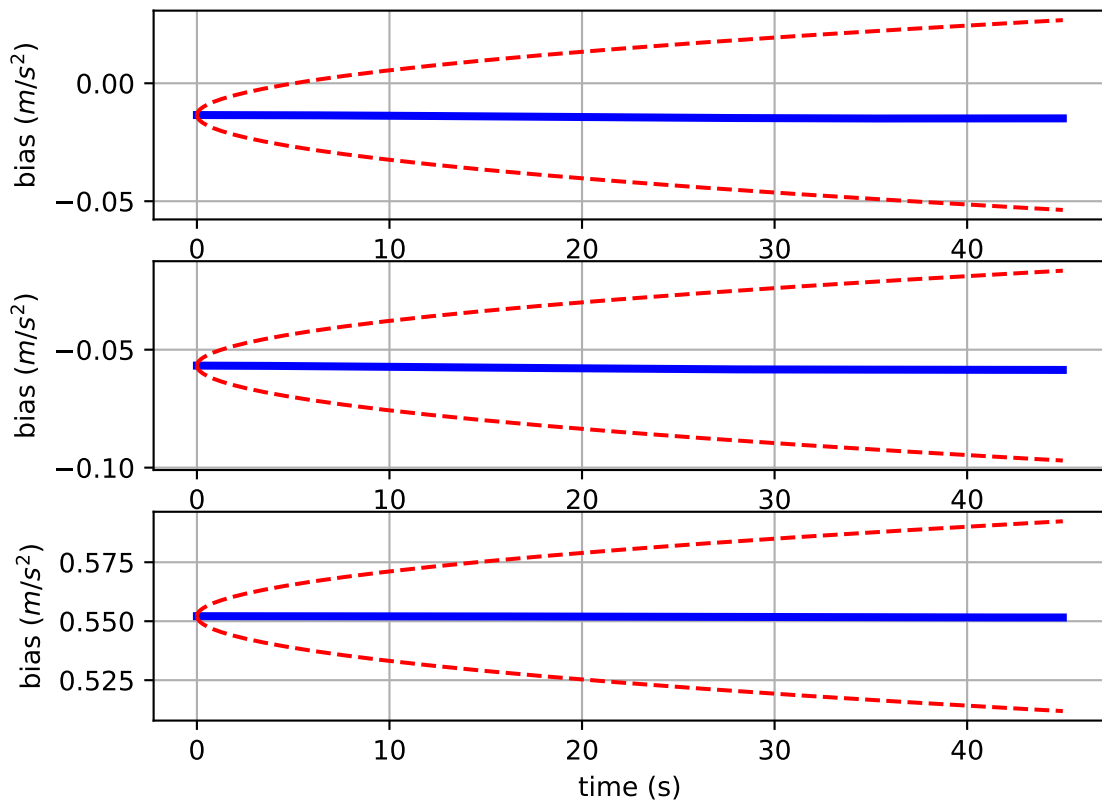
Comparison of predicted and measured specific force (imu0 frame)



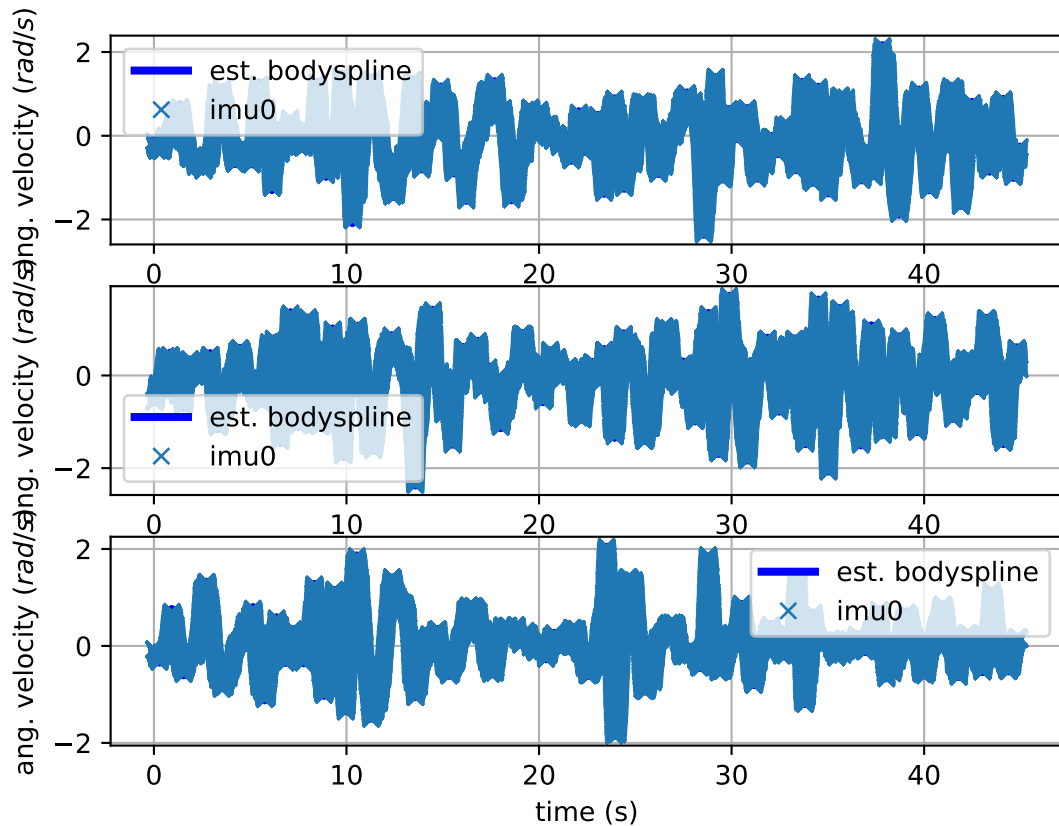
imu0: acceleration error



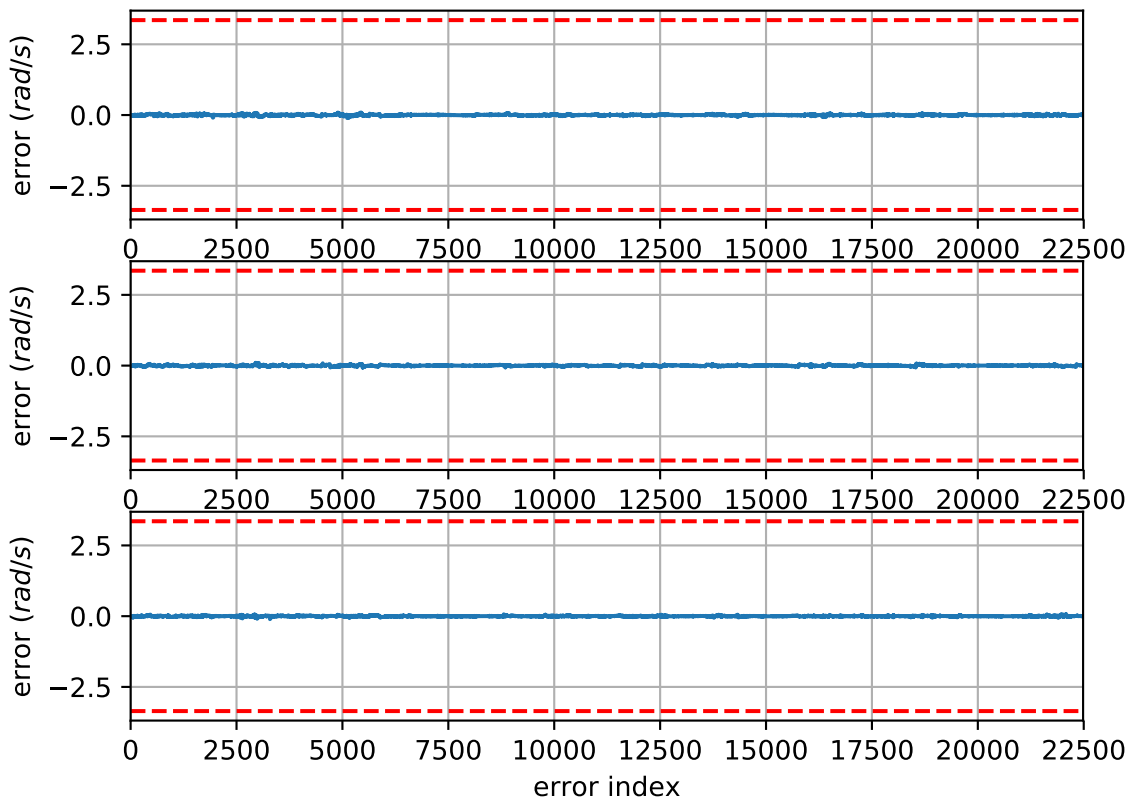
imu0: estimated accelerometer bias (imu frame)



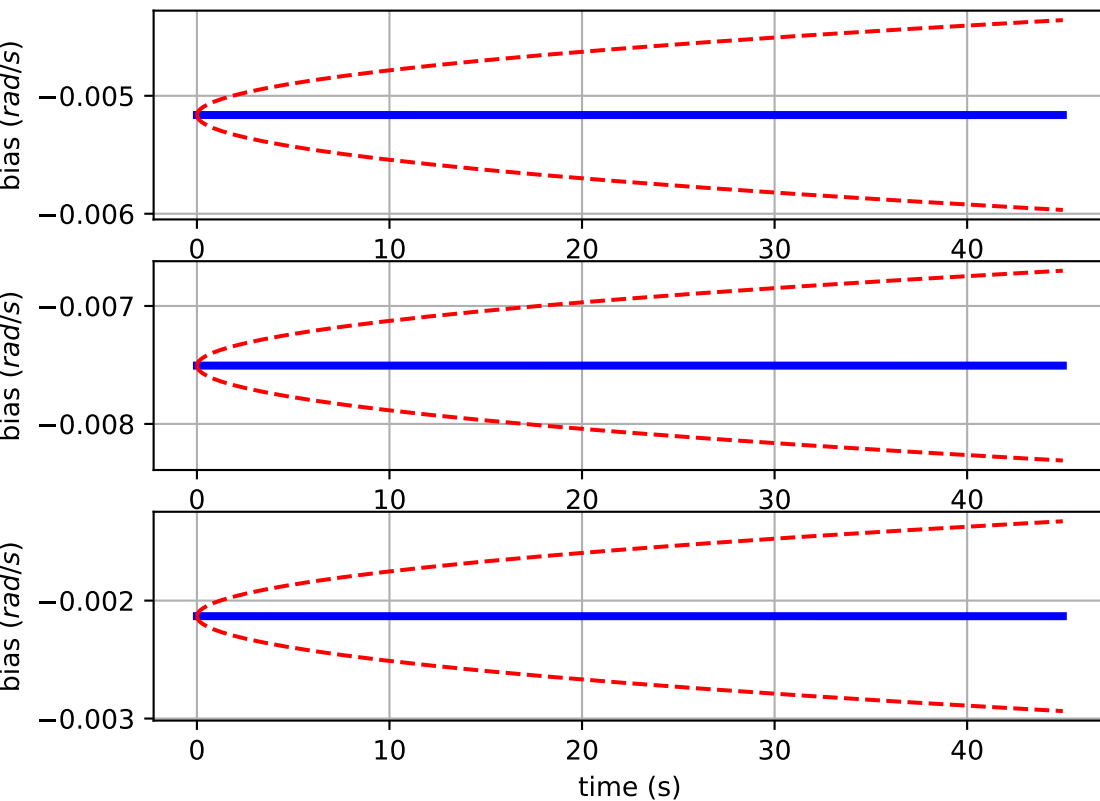
Comparison of predicted and measured angular velocities (body frame)



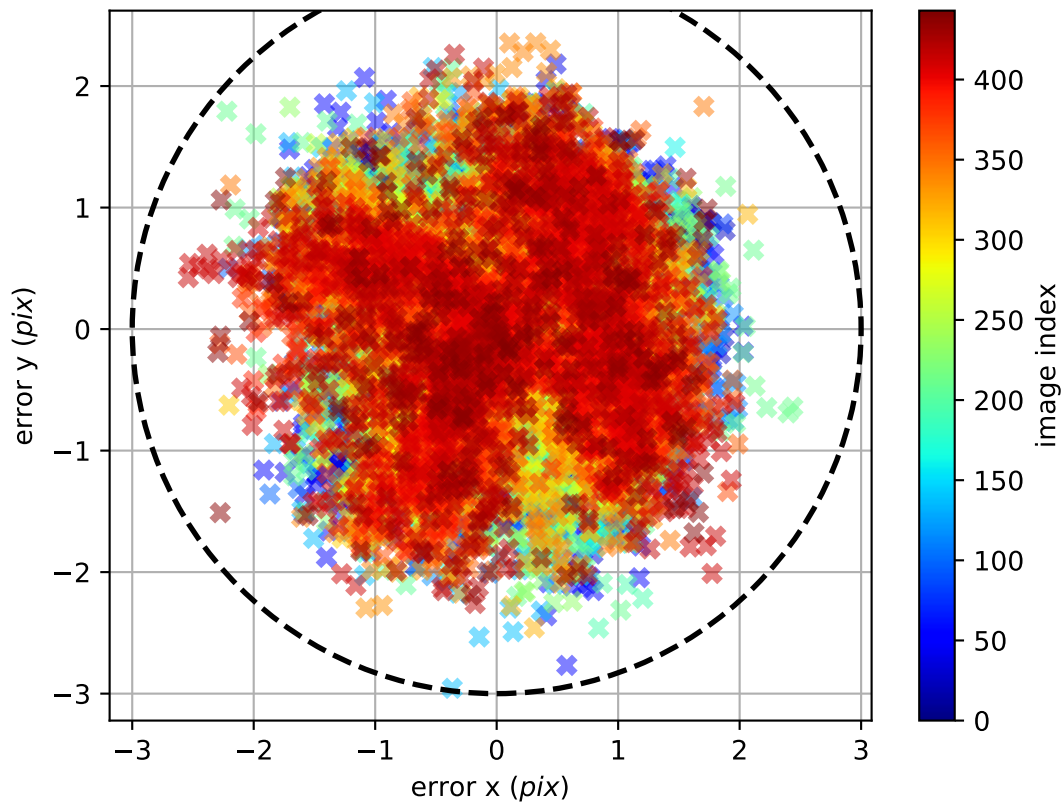
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

