

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 0.0774936766896, median 0.074499140291, std: 0.0380238341213
Reprojection error (cam1): mean 0.07882463145, median 0.0761252947391, std: 0.0378018849344
Gyroscope error (imu0): mean 0.268272169255, median 0.264539696949, std: 0.100642481992
Accelerometer error (imu0): mean 0.113968875005, median 0.0928461821373, std: 0.0908351871357

Residuals

Reprojection error (cam0) [px]: mean 0.0774936766896, median 0.074499140291, std: 0.0380238341213
Reprojection error (cam1) [px]: mean 0.07882463145, median 0.0761252947391, std: 0.0378018849344
Gyroscope error (imu0) [rad/s]: mean 0.0110242485302, median 0.010870868094, std: 0.00413575413825
Accelerometer error (imu0) [m/s²]: mean 0.0165715237875, median 0.013500200961, std: 0.0132077943587

Transformation (cam0):

T_ci: (imu0 to cam0):

```
[[-0.00053157 0.99999968 -0.0006 0.04650007]
 [-0.99999379 -0.00053366 -0.00348384 0.0011747 ]
 [-0.00348416 0.00059814 0.99999375 -0.05580188]
 [ 0. 0. 0. 1.  ]]
```

T_ic: (cam0 to imu0):

```
[[-0.00053157 -0.99999379 -0.00348416 0.00100499]
 [ 0.99999968 -0.00053366 0.00059814 -0.04646605]
 [-0.0006 -0.00348384 0.99999375 0.05583352]
 [ 0. 0. 0. 1.  ]]
```

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

-0.000251115802511

Transformation (cam1):

T_ci: (imu0 to cam1):

```
[[-0.00243568 0.9999429 -0.01040508 -0.07345131]
 [-0.99999702 -0.00243749 -0.00016123 0.0017023 ]
 [-0.00018658 0.01040466 0.99994585 -0.05605961]
```

[0. 0. 0. 1.]]

T_ic: (cam1 to imu0):

[[-0.00243568 -0.99999702 -0.00018658 0.00151293]
[0.9999429 -0.00243749 0.01040466 0.07403454]
[-0.01040508 -0.00016123 0.99994585 0.05529258]
[0. 0. 0. 1.]]

timeshift cam1 to imu0: [s] (t_imu = t_cam + shift)
-0.000241218032677

Baselines:

Baseline (cam0 to cam1):

[[0.99995012 0.00193829 -0.00979842 -0.12049811]
[-0.00190582 0.99999267 0.00332147 0.00080157]
[0.00980478 -0.00330263 0.99994648 -0.00071276]
[0. 0. 0. 1.]]

baseline norm: 0.120502881608 [m]

Gravity vector in target coords: [m/s^2]
[-2.03800846 -9.25488662 -2.5223041]

Calibration configuration

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cam0

Camera model: pinhole

Focal length: [367.71882690834684, 367.8997611941668]

Principal point: [363.2050896702571, 241.41309704552276]

Distortion model: equidistant

Distortion coefficients: [-0.0226992116992898, -0.007929704806643853, 0.010855420447887539, -0.007870837163604226]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.055 [m]

Spacing 0.0165 [m]

cam1

Camera model: pinhole

Focal length: [367.3175171091687, 367.51018516079296]

Principal point: [379.9181352700179, 245.6604416513078]

Distortion model: equidistant

Distortion coefficients: [-0.024159795405994777, -0.0016427550056584627, -0.00123690815864029, 0.0002691709729243612]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.055 [m]

Spacing 0.0165 [m]

IMU configuration

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IMU0:

Model: calibrated

Update rate: 200.0

Accelerometer:

Noise density: 0.0102816113998

Noise density (discrete): 0.145403942846

Random walk: 0.000215682970522

Gyroscope:

Noise density: 0.0029057508704

Noise density (discrete): 0.041093522898

Random walk: 8.46079583185e-05

T_i_b

[[1. 0. 0. 0.]

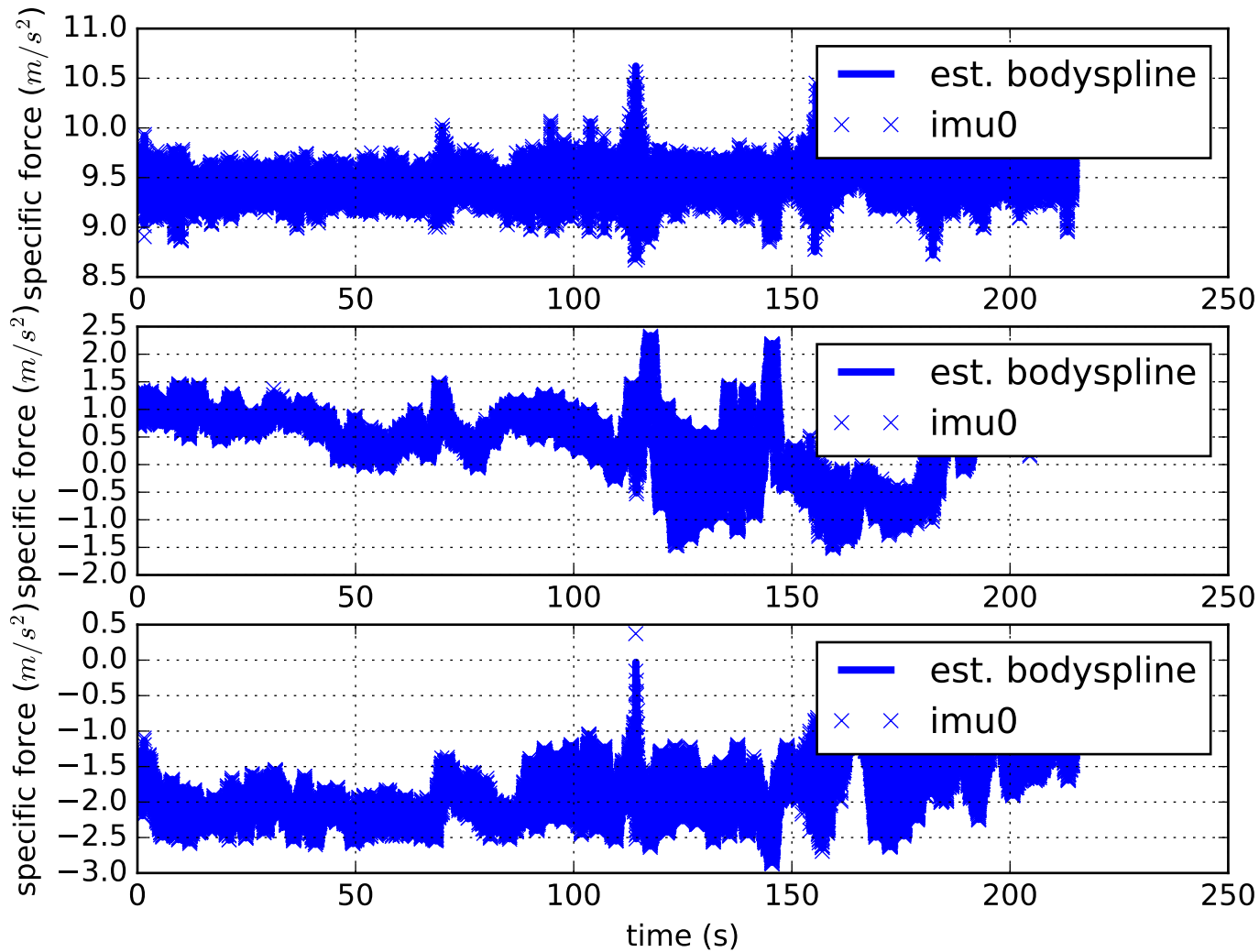
[0. 1. 0. 0.]

[0. 0. 1. 0.]

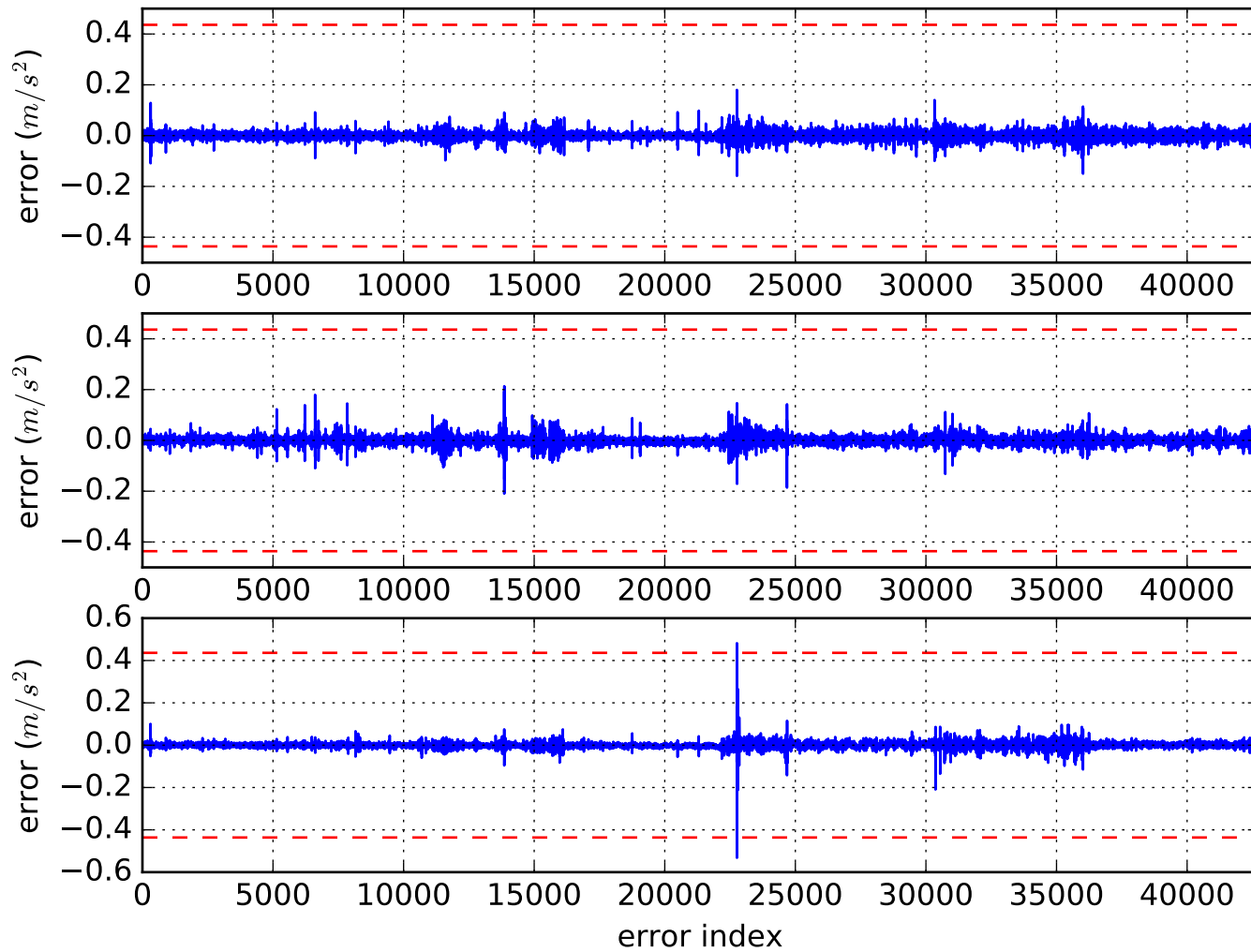
[0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

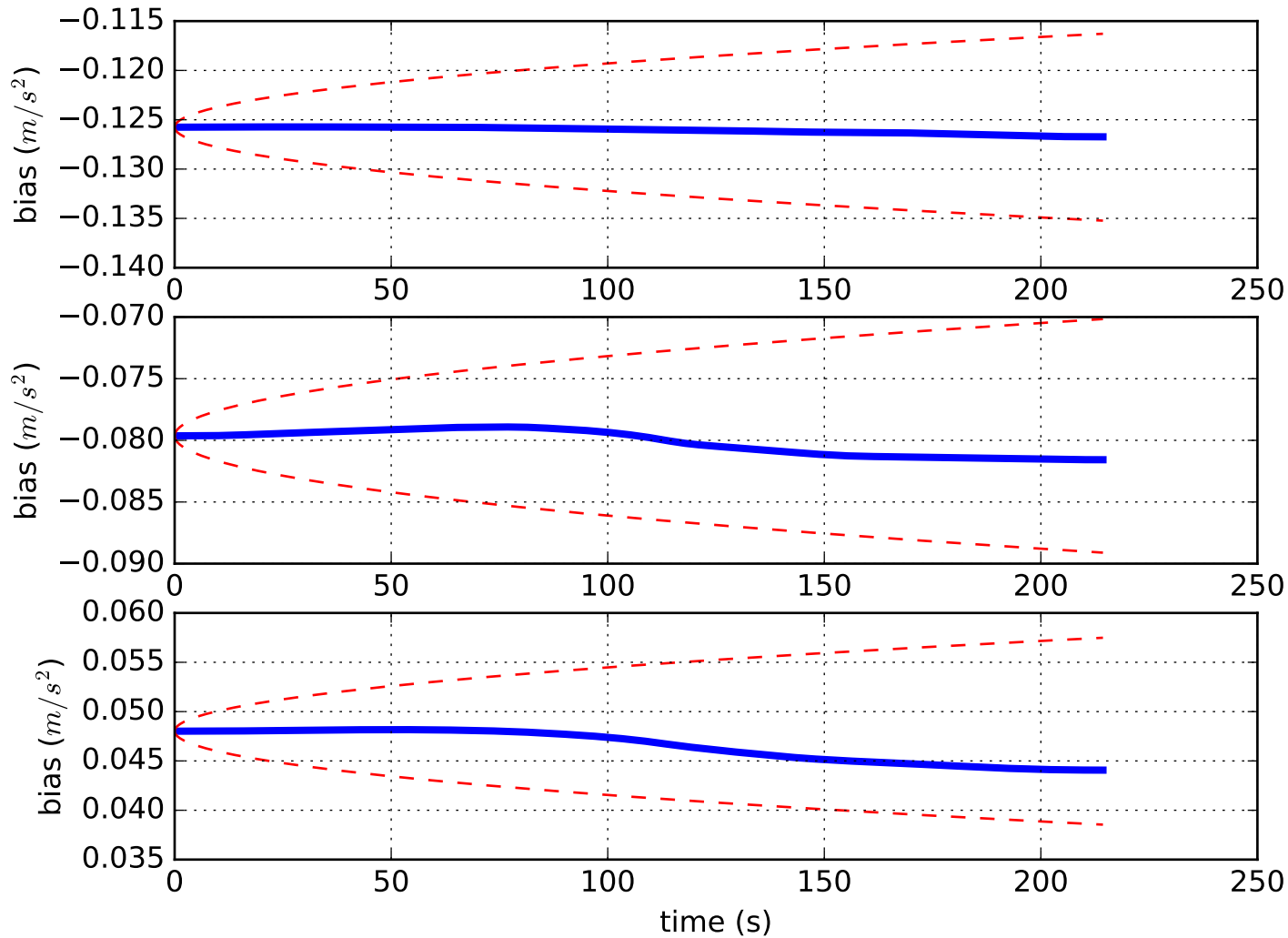
Comparison of predicted and measured specific force (imu0 frame)



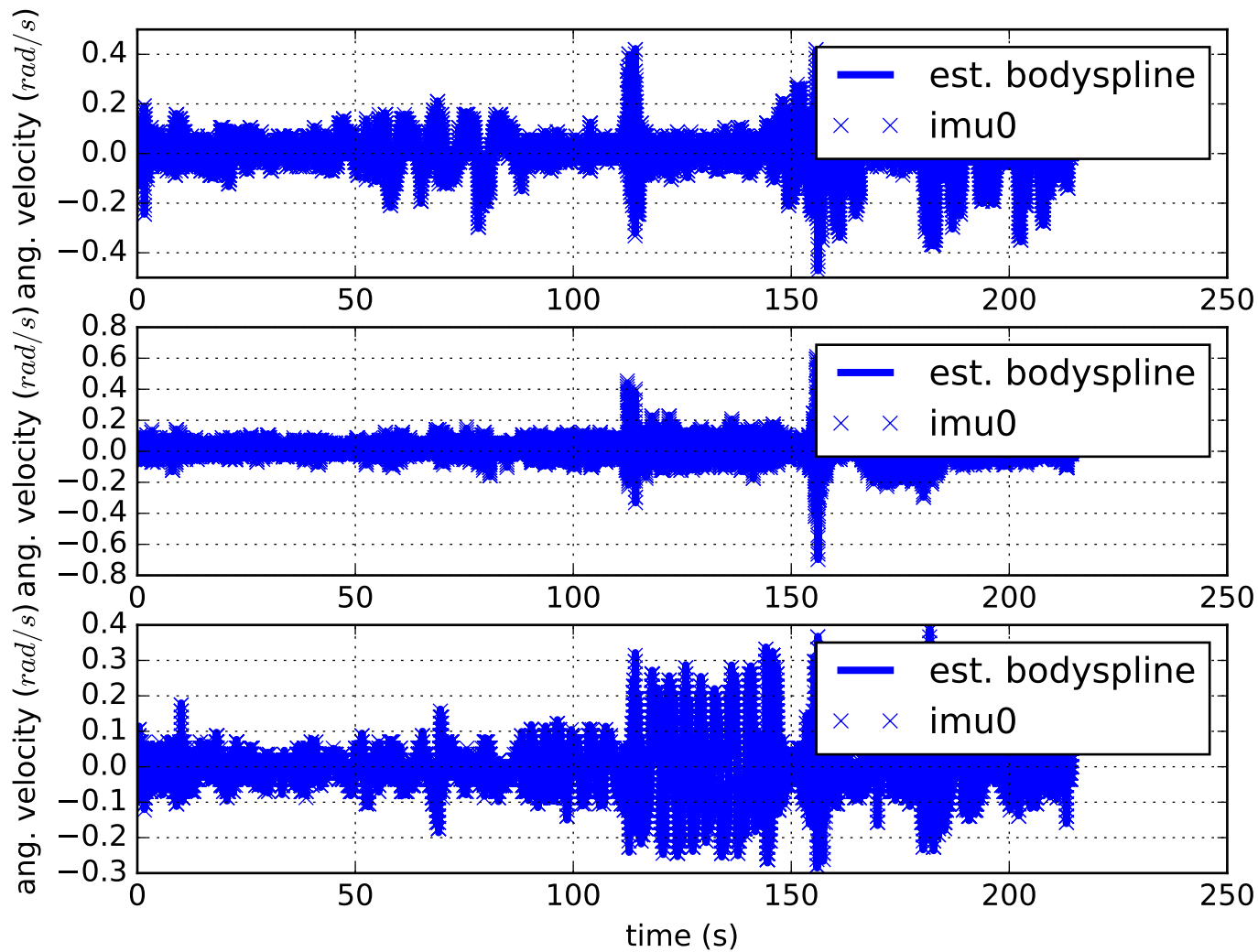
imu0: acceleration error



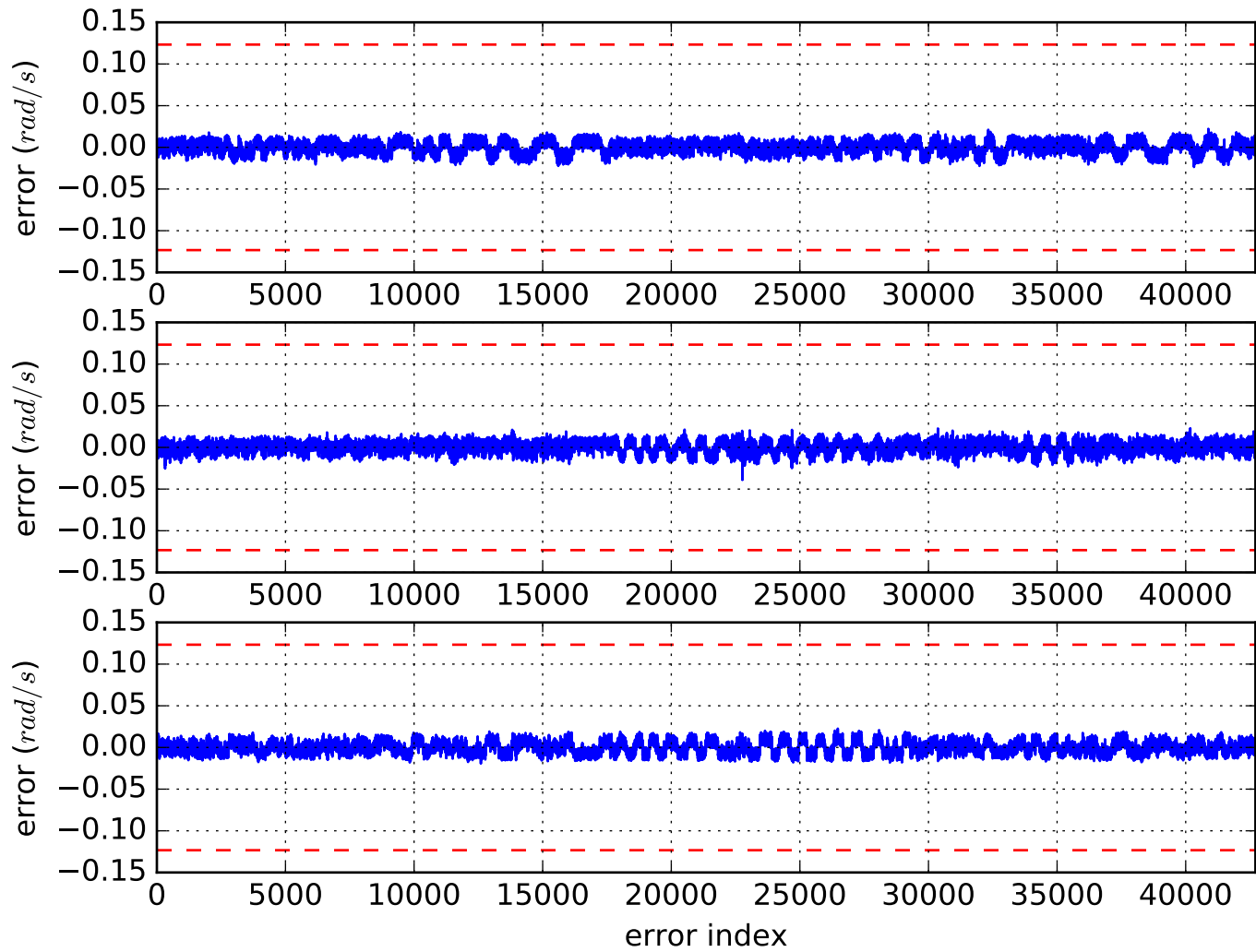
imu0: estimated accelerometer bias (imu frame)



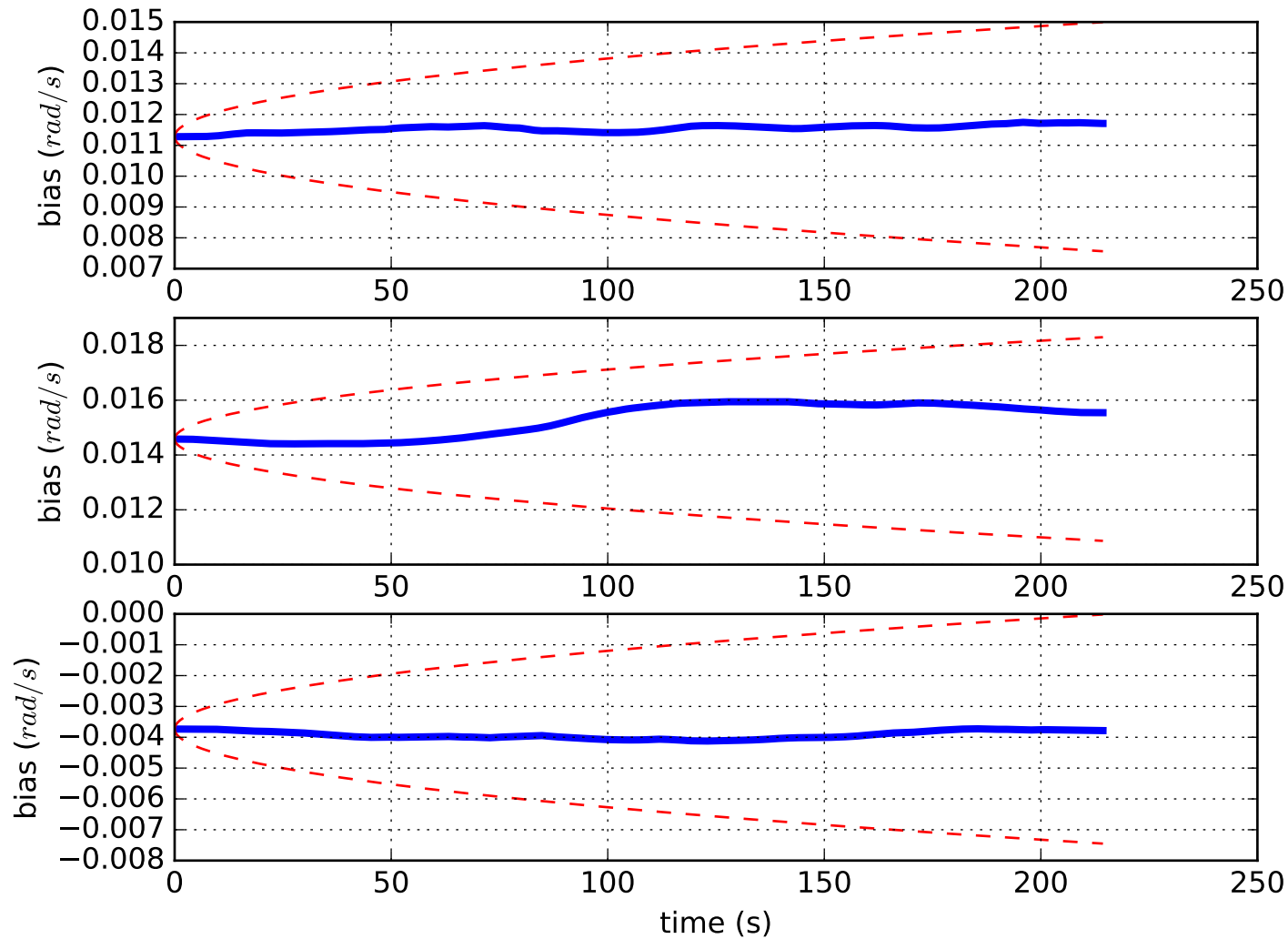
Comparison of predicted and measured angular velocities (body frame)



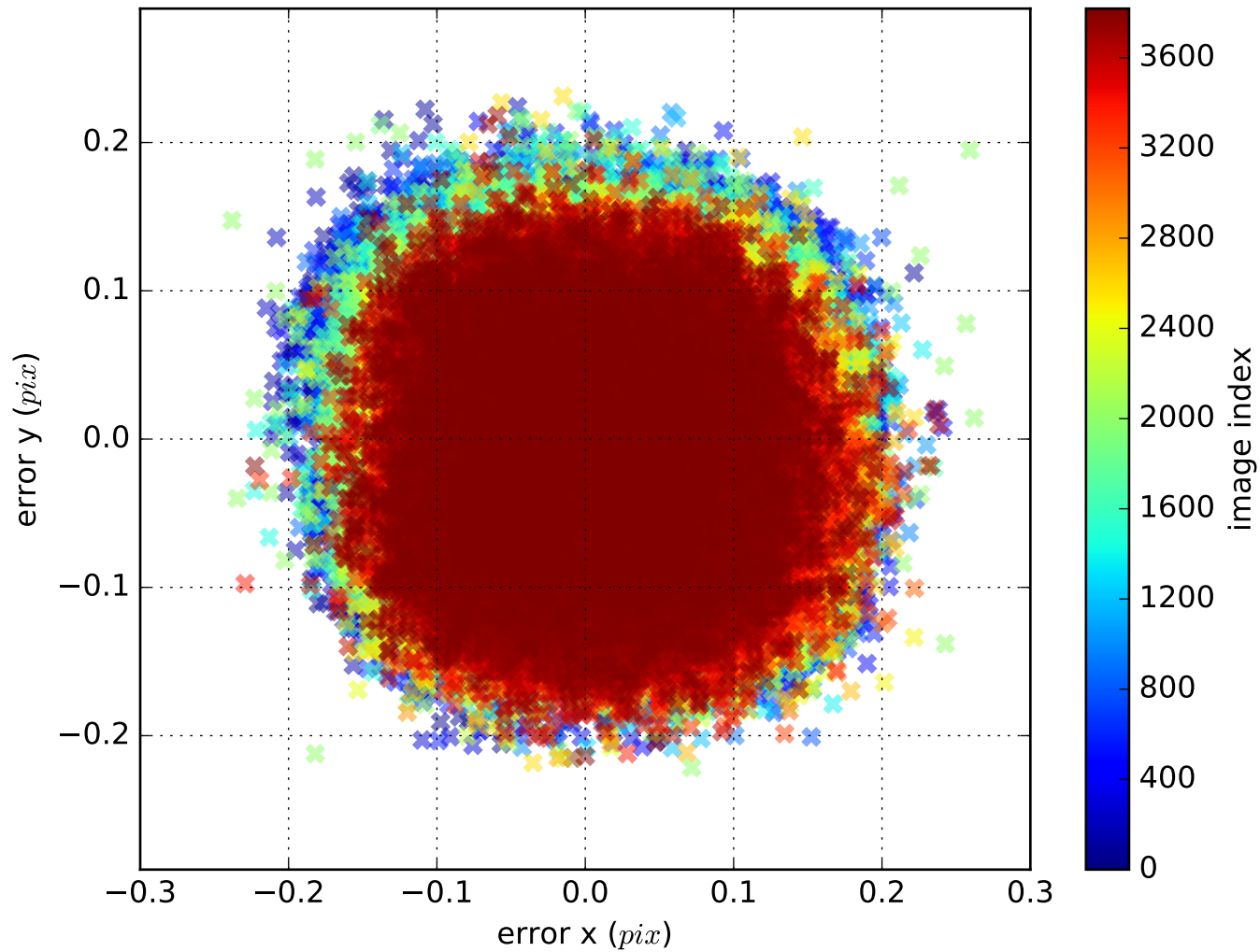
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

