

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 1.05994900479, median 1.03713272788, std: 0.419815404289

Reprojection error (cam1): mean 1.00424664769, median 0.990728383077, std: 0.439559536334

Gyroscope error (imu0): mean 11.0884249254, median 8.27479787652, std: 10.3767697958

Accelerometer error (imu0): mean 2.67307040038, median 2.07852138051, std: 2.11727608353

Residuals

Reprojection error (cam0) [px]: mean 1.05994900479, median 1.03713272788, std: 0.419815404289

Reprojection error (cam1) [px]: mean 1.00424664769, median 0.990728383077, std: 0.439559536334

Gyroscope error (imu0) [rad/s]: mean 0.0136846034568, median 0.0102122103353, std: 0.0128063255849

Accelerometer error (imu0) [m/s^2]: mean 0.037802924134, median 0.02939473126, std: 0.0299428055262

Transformation (cam0):

T_ci: (imu0 to cam0):

```
[[-0.99997187  0.00570479  0.00486961 -0.07008262]
 [ 0.0049104   0.00715936  0.99996232  0.00709583]
 [ 0.00566971  0.9999581  -0.00718717 -0.08367737]
 [ 0.          0.          0.          1.        ]]
```

T_ic: (cam0 to imu0):

```
[[-0.99997187  0.0049104   0.00566971 -0.06964107]
 [ 0.00570479  0.00715936  0.9999581   0.08402287]
 [ 0.00486961  0.99996232 -0.00718717 -0.00735569]
 [ 0.          0.          0.          1.        ]]
```

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

0.0258141499147

Transformation (cam1):

T_ci: (imu0 to cam1):

```
[[-0.99995853  0.00887816  0.00202681  0.07539631]
 [ 0.00212507  0.01107198  0.99993645  0.00670728]
 [ 0.00885516  0.99989929 -0.01109039 -0.08212391]
```

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

T_ic: (cam1 to imu0):

```
[[ -0.99995853  0.00212507  0.00885516  0.07610615]
 [ 0.00887816  0.01107198  0.99989929  0.081372 ]
 [ 0.00202681  0.99993645 -0.01109039 -0.00777045]
 [ 0.      0.      0.      1.      ]]
```

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

```
0.00618962566705
```

Baselines:

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Baseline (cam0 to cam1):

```
[[ 0.99999092 -0.0028199  0.00319375  0.14576555]
 [ 0.00280745  0.99998847  0.00389685  0.00013436]
 [-0.0032047 -0.00388785  0.99998731  0.00135539]
 [ 0.      0.      0.      1.      ]]
baseline norm: 0.145771912092 [m]
```

Gravity vector in target coords: [m/s^2]

```
[-0.00875363 -9.64758575 -1.7585322 ]
```

Calibration configuration

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cam0

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Camera model: pinhole

Focal length: [587.5797877060857, 587.486122072887]

Principal point: [362.8988815399364, 262.046725541524]

Distortion model: equidistant

Distortion coefficients: [-0.012899495636846468, -0.027916290461994033, 0.06637607911365971, -0.06823073549469741]

Type: aprilgrid

Tags:

Rows: 7

Cols: 10

Size: 0.05 [m]

Spacing 0.015 [m]

cam1

Camera model: pinhole

Focal length: [592.4875327648471, 592.7091369782029]

Principal point: [353.66618950660575, 264.2373266069112]

Distortion model: equidistant

Distortion coefficients: [-0.017530230705130313, -0.0010294452735571758, -0.0262039351056189, 0.032077998320939015]

Type: aprilgrid

Tags:

Rows: 7

Cols: 10

Size: 0.05 [m]

Spacing 0.015 [m]

IMU configuration

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IMU0:

Model: calibrated

Update rate: 200.0

Accelerometer:

 Noise density: 0.001

 Noise density (discrete): 0.0141421356237

 Random walk: 0.001

Gyroscope:

 Noise density: 8.726646e-05

 Noise density (discrete): 0.00123413411272

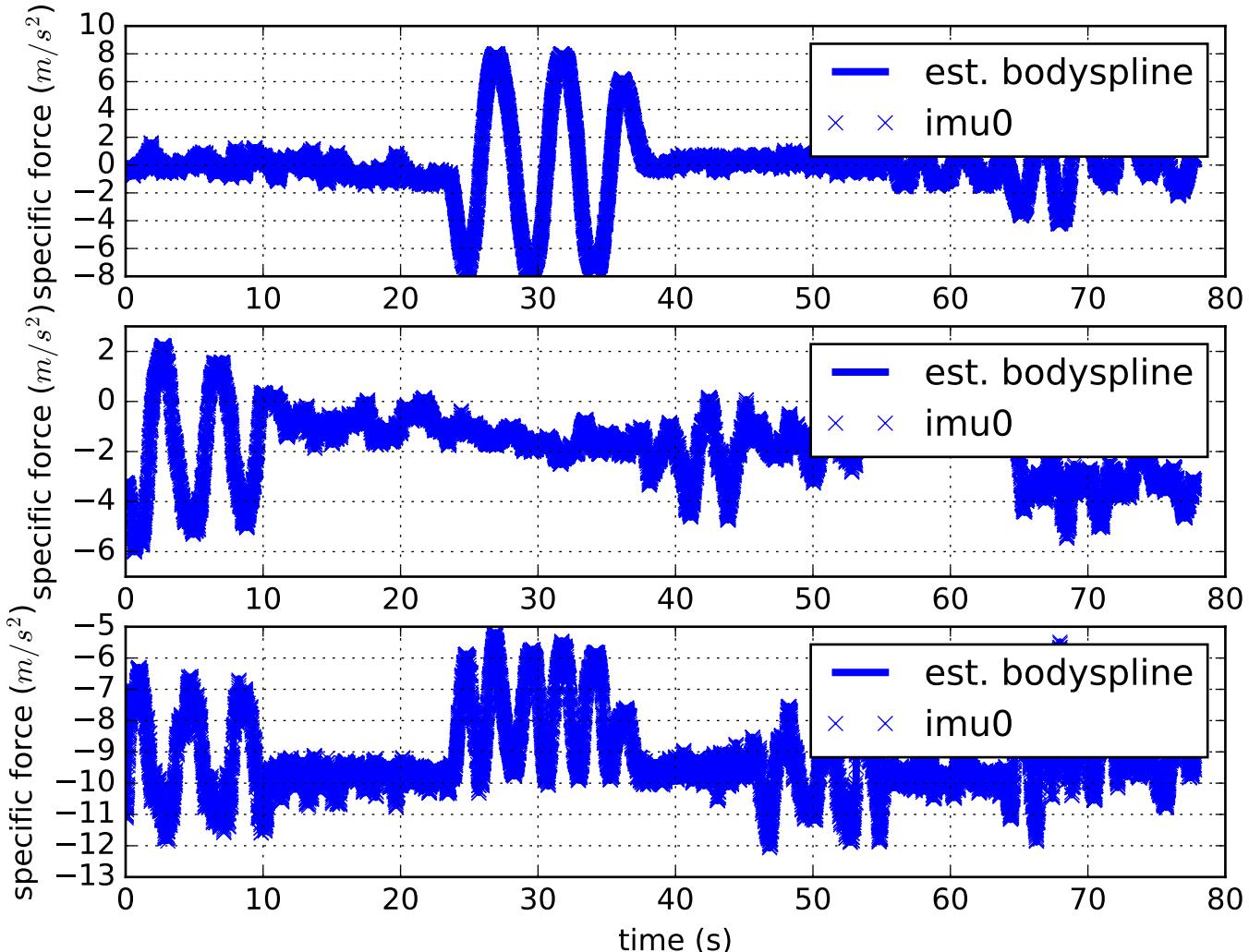
 Random walk: 2.908882e-05

T_i_b

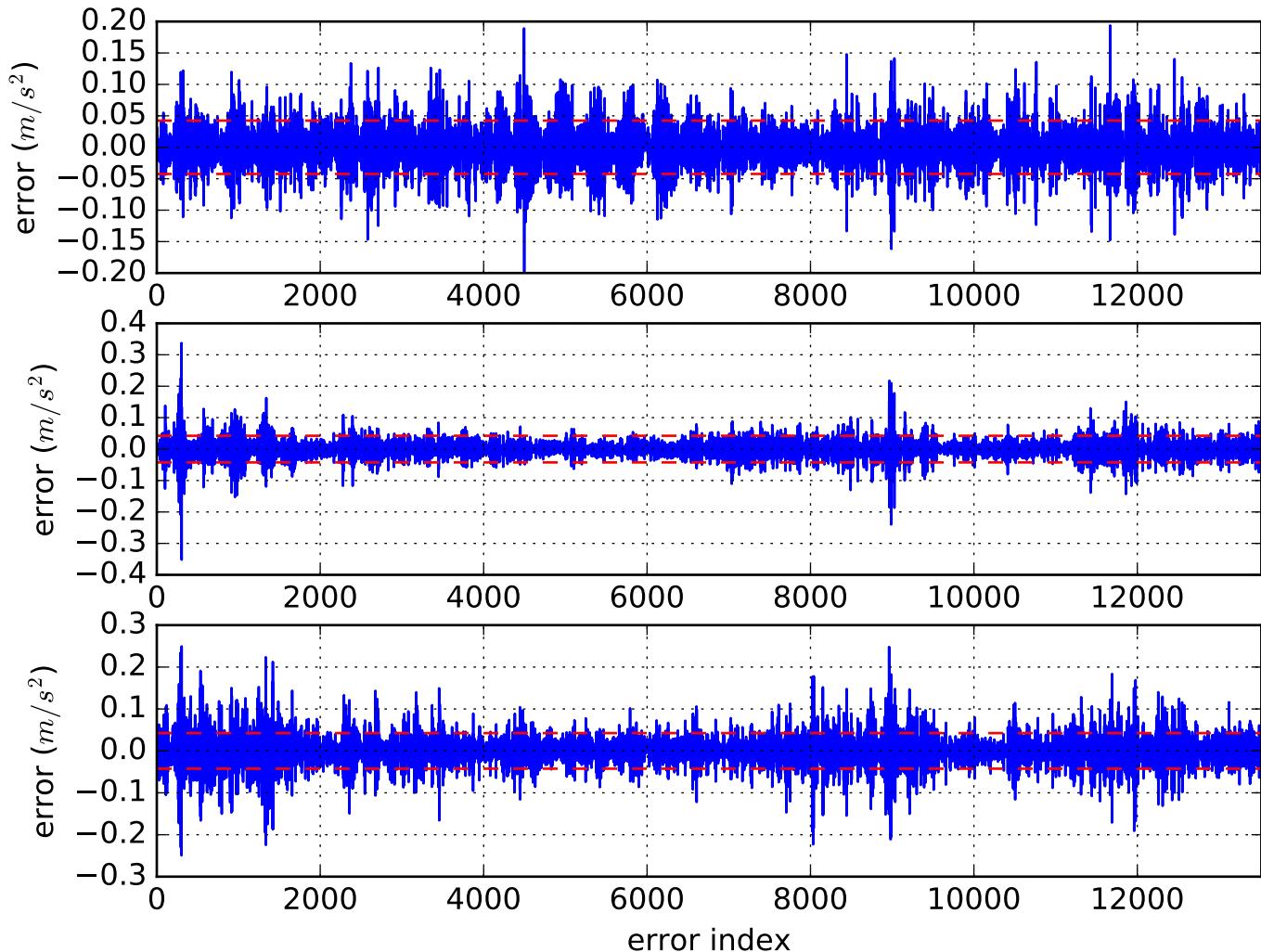
[[1. 0. 0. 0.]
[0. 1. 0. 0.]
[0. 0. 1. 0.]
[0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

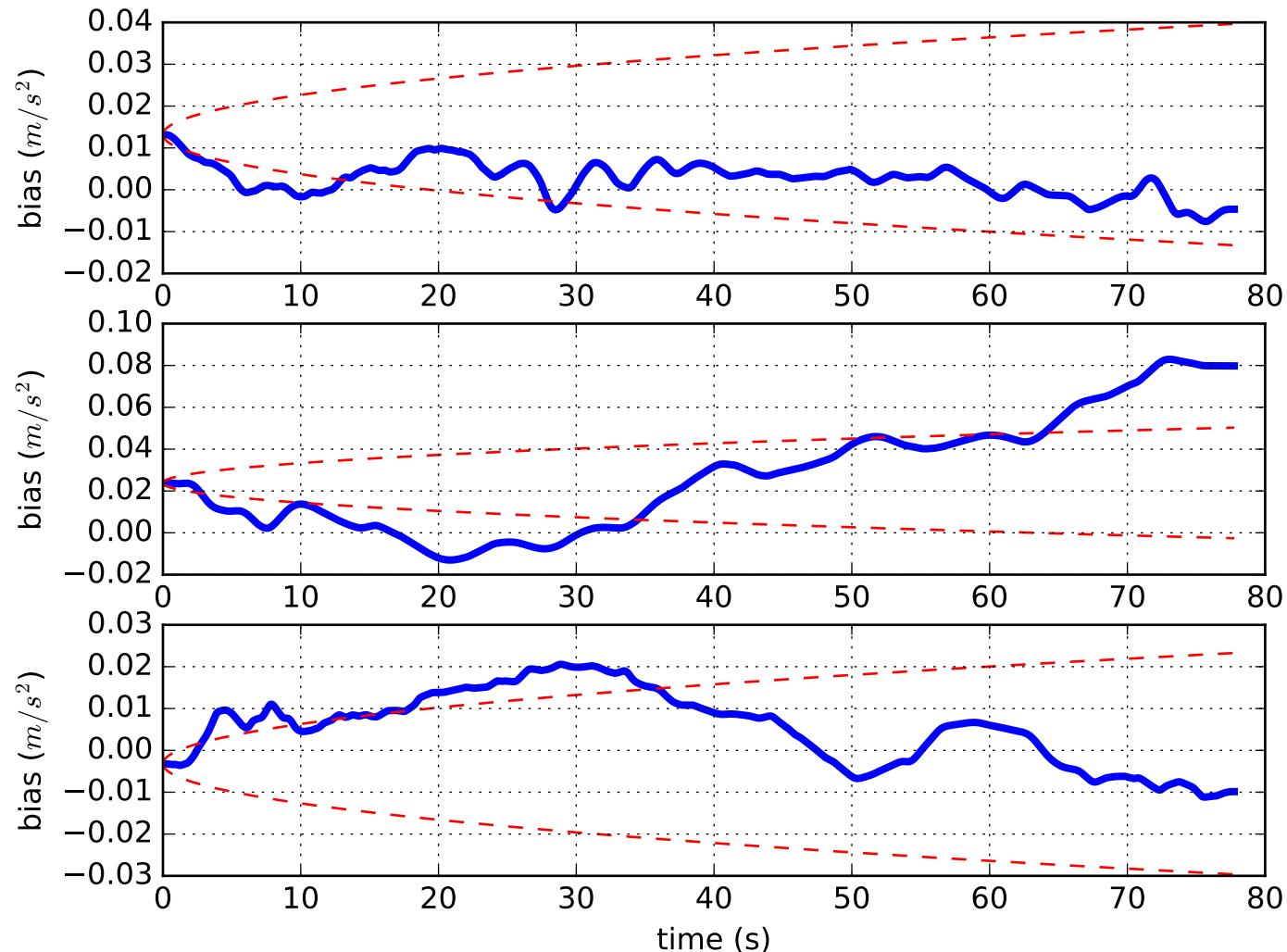
Comparison of predicted and measured specific force (imu0 frame)



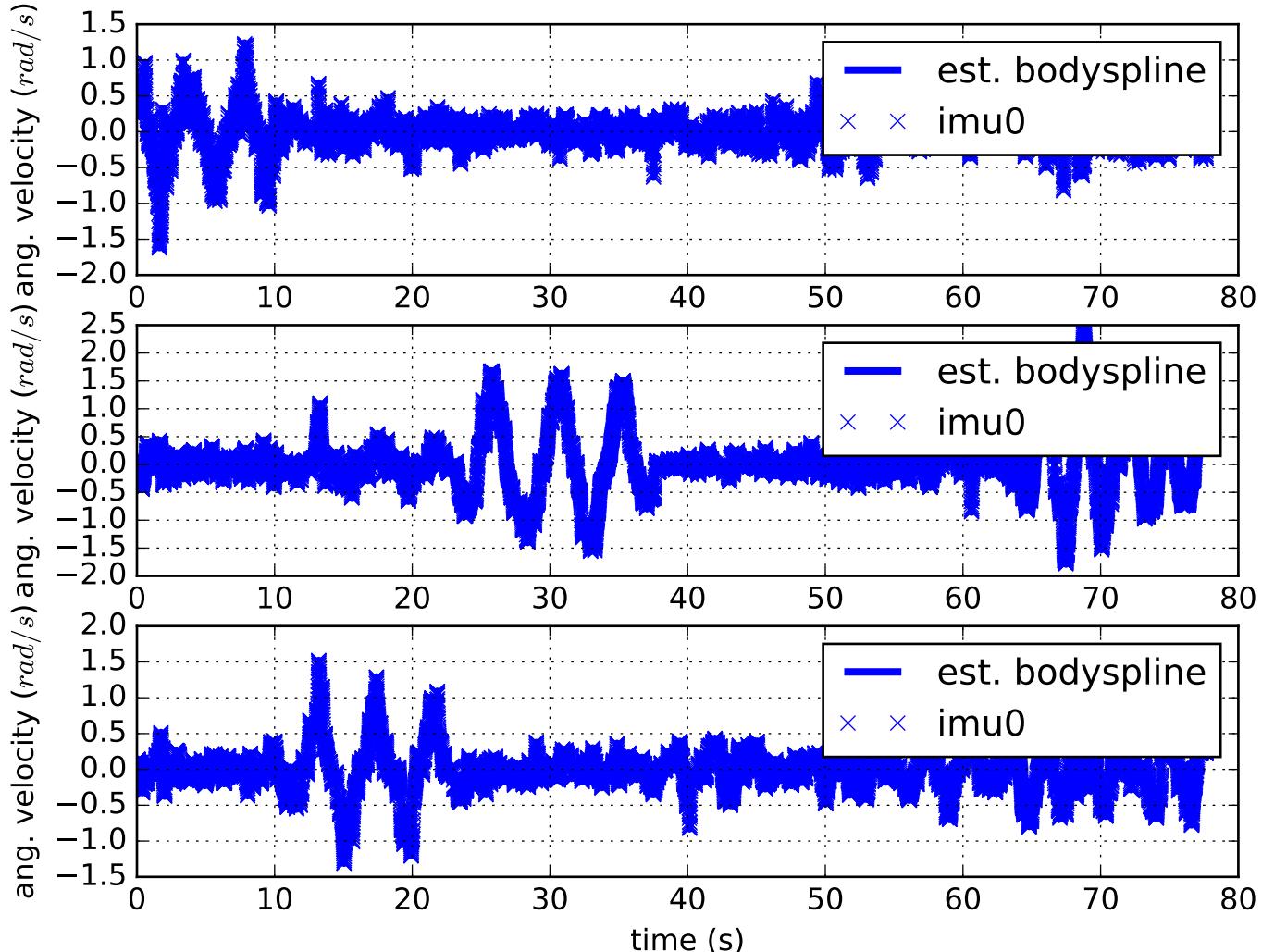
imu0: acceleration error



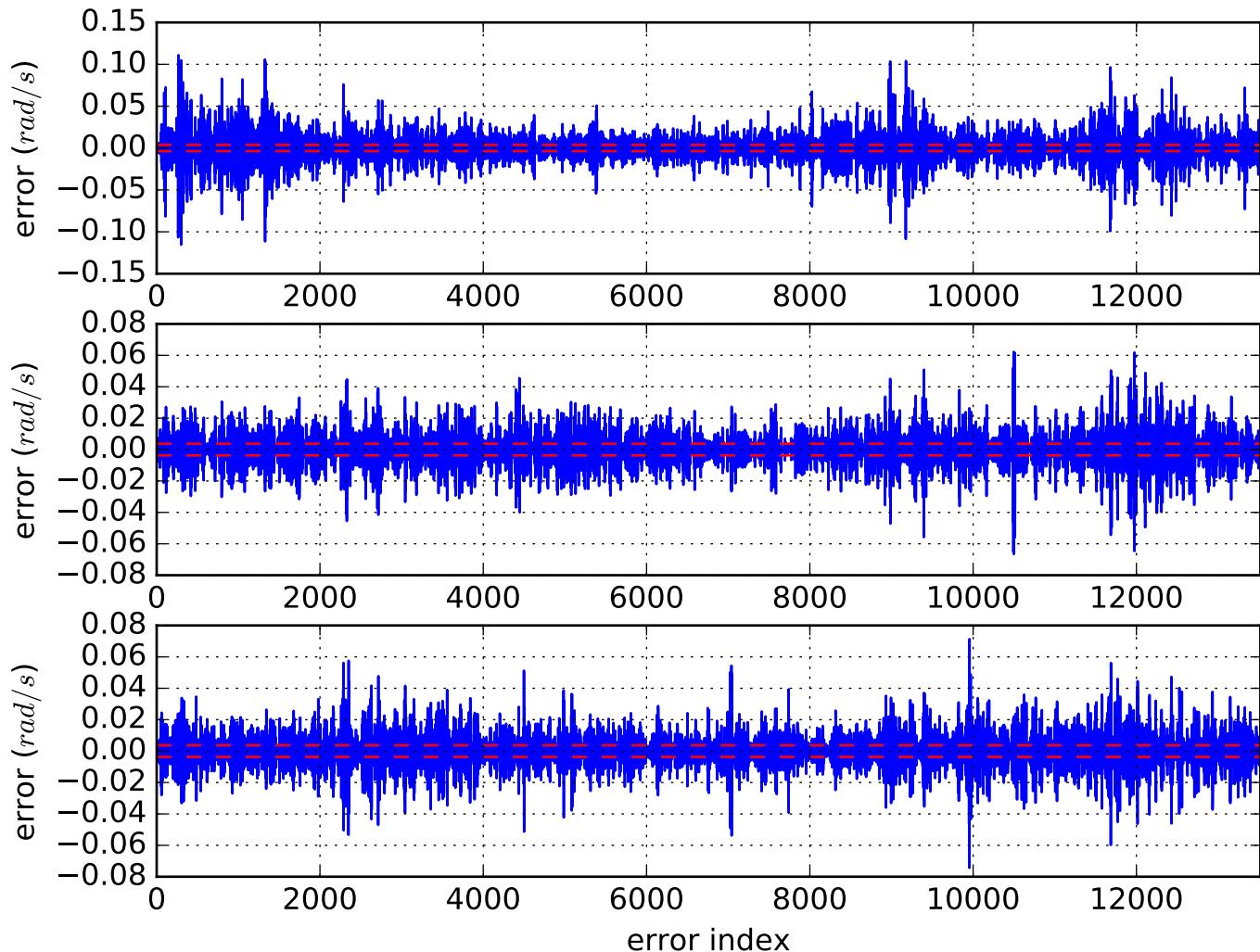
imu0: estimated accelerometer bias (imu frame)



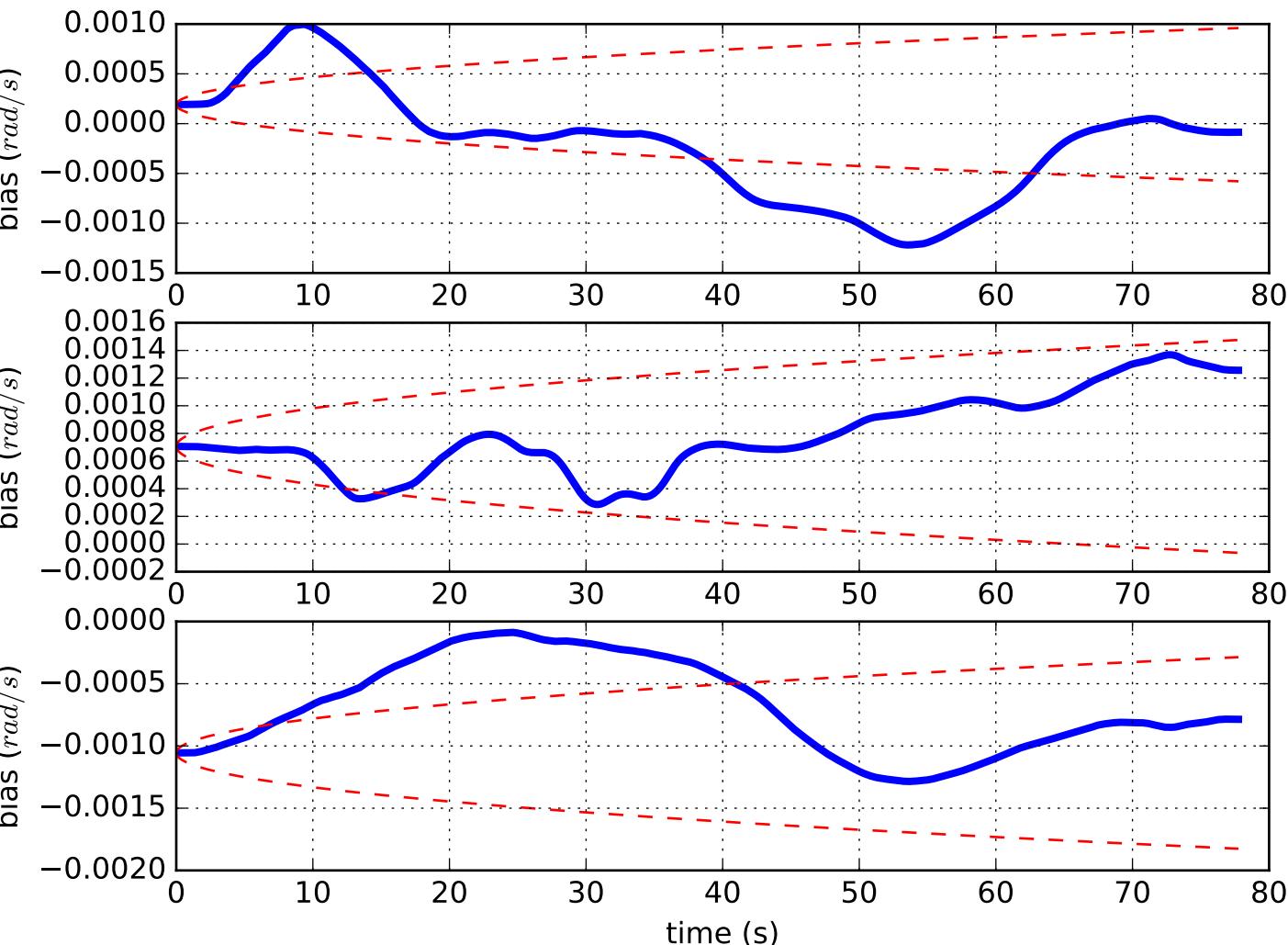
Comparison of predicted and measured angular velocities (body frame)



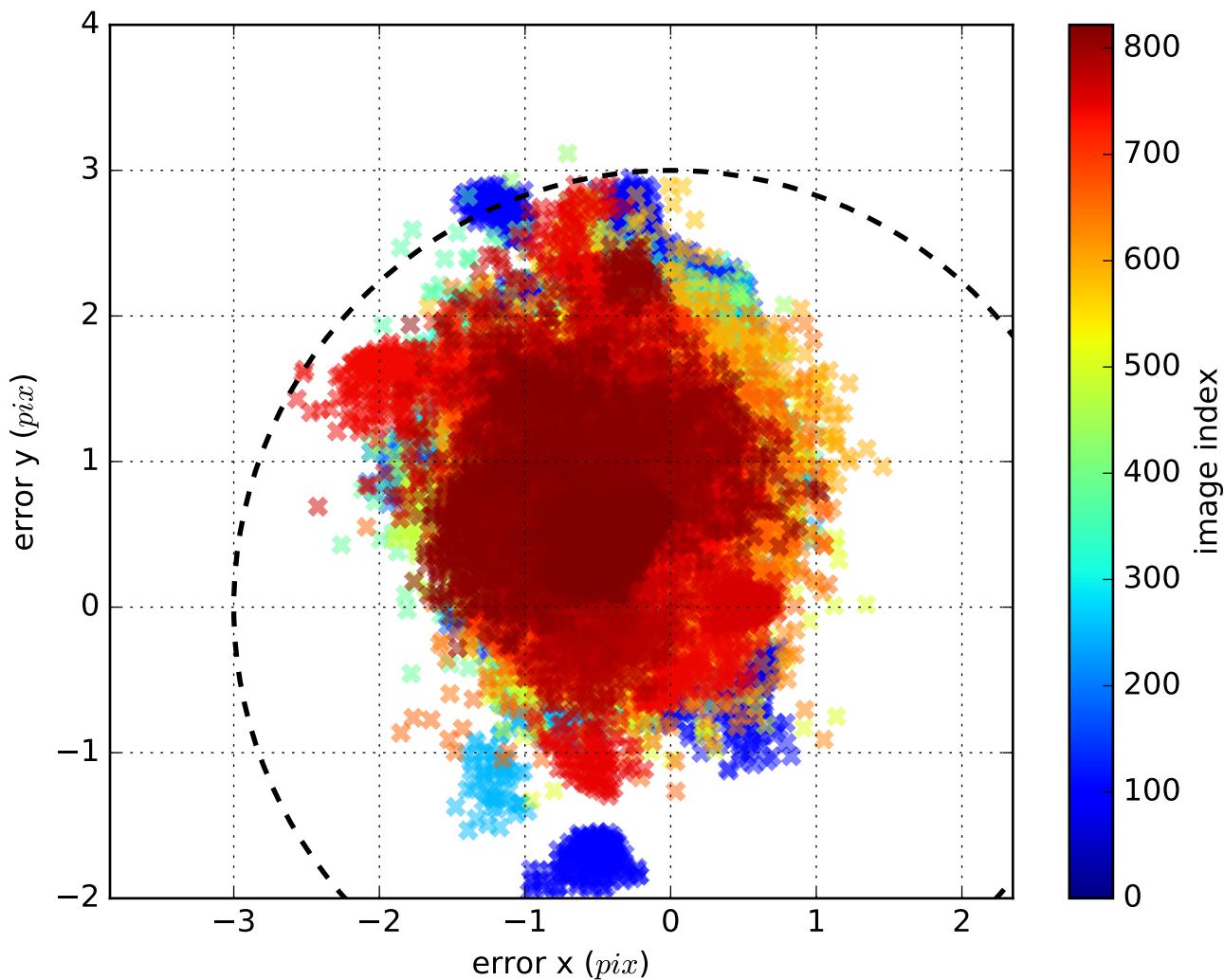
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

