

Calibration results

=====

Normalized Residuals

Reprojection error (cam0): mean 0.132580258153, median 0.101659888932, std: 0.120883511499

Reprojection error (cam1): mean 0.129622771432, median 0.0959812363519, std: 0.123564867021

Gyroscope error (imu0): mean 1.14955059038, median 0.488306261395, std: 1.50221989292

Accelerometer error (imu0): mean 0.427915890169, median 0.286936683406, std: 0.414390198487

Residuals

Reprojection error (cam0) [px]: mean 0.132580258153, median 0.101659888932, std: 0.120883511499

Reprojection error (cam1) [px]: mean 0.129622771432, median 0.0959812363519, std: 0.123564867021

Gyroscope error (imu0) [rad/s]: mean 0.045407634221, median 0.0192882612481, std: 0.0593381900613

Accelerometer error (imu0) [m/s^2]: mean 0.343014939504, median 0.230006810593, std: 0.332172822115

Transformation (cam0):

T_ci: (imu0 to cam0):

```
[[ 0.99994207 -0.0004406 -0.0107543 -0.01146189]
 [ 0.00040811  0.99999535 -0.00302324 -0.00687172]
 [ 0.01075559  0.00301868  0.9999376 -0.05204526]
 [ 0.          0.          0.          1.        ]]
```

T_ic: (cam0 to imu0):

```
[[ 0.99994207  0.00040811  0.01075559  0.01202381]
 [-0.0004406   0.99999535  0.00301868  0.00702375]
 [-0.0107543  -0.00302324  0.9999376   0.05189798]
 [ 0.          0.          0.          1.        ]]
```

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

-0.000858735589895

Transformation (cam1):

T_ci: (imu0 to cam1):

```
[[ 0.99997245 -0.00056978 -0.00740082 -0.06075597]
 [ 0.00055232  0.99999706 -0.00236214 -0.00688842]
 [ 0.00740214  0.00235798  0.99996982 -0.0517994 ]]
```

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

T_ic: (cam1 to imu0):

```
[[ 0.99997245  0.00055232  0.00740214  0.06114153]
 [-0.00056978  0.99999706  0.00235798  0.00697592]
 [-0.00740082 -0.00236214  0.99996982  0.05133192]
 [ 0.      0.      0.      1.      ]]
```

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

```
-0.000859232396824
```

Baselines:

=====

Baseline (cam0 to cam1):

```
[[ 0.99999437 -0.00013931  0.00335321 -0.04912058]
 [ 0.00013709  0.99999977  0.00066262  0.00001936]
 [-0.00335331 -0.00066216  0.99999416  0.00020258]
 [ 0.      0.      0.      1.      ]]
baseline norm: 0.0491210013815 [m]
```

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

```
[ 0.03883682 -9.80636452  0.04614735]
```

Calibration configuration

=====

cam0

====

Camera model: pinhole

Focal length: [388.4650285832336, 387.800159554117]

Principal point: [315.9973473913636, 238.7466365141982]

Distortion model: radtan

Distortion coefficients: [0.008399214615386863, -0.002806180998456902, 0.00015958006611416328, 0.0006614615167286668]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.021 [m]

Spacing 0.0063 [m]

cam1

Camera model: pinhole

Focal length: [388.4665717299608, 387.789127627151]

Principal point: [313.8153096439829, 238.36096518287948]

Distortion model: equidistant

Distortion coefficients: [0.33820660433187266, 0.18408566832395054, -0.11260678492585198, 0.21248736189169395]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.021 [m]

Spacing 0.0063 [m]

IMU configuration

=====

IMU0:

Model: calibrated

Update rate: 200.0

Accelerometer:

 Noise density: 0.0566812767051

 Noise density (discrete): 0.80159430249

 Random walk: 0.00109147731599

Gyroscope:

 Noise density: 0.00279309552306

 Noise density (discrete): 0.0395003356972

 Random walk: 2.75714767325e-05

T_i_b

[[1. 0. 0. 0.]

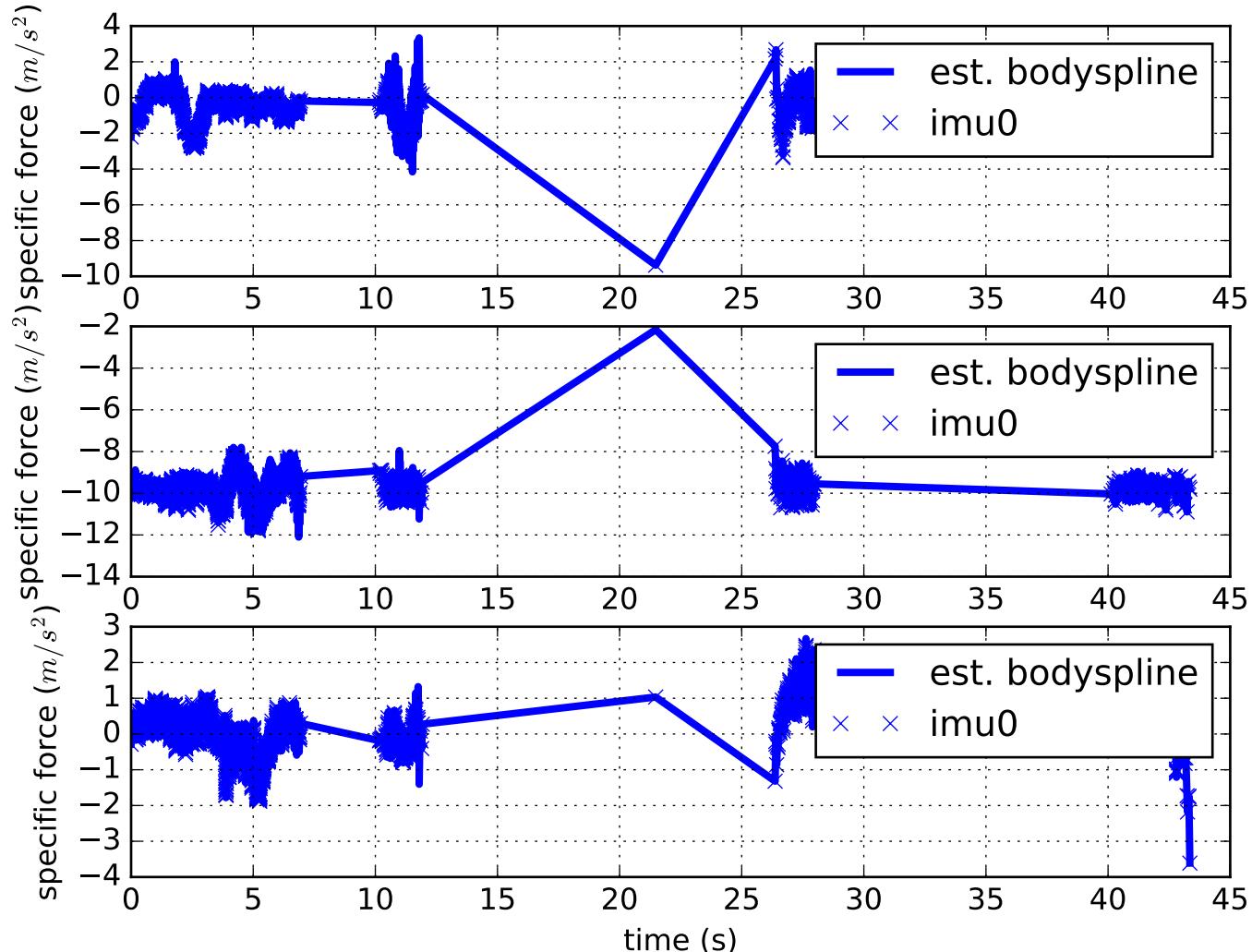
 [0. 1. 0. 0.]

 [0. 0. 1. 0.]

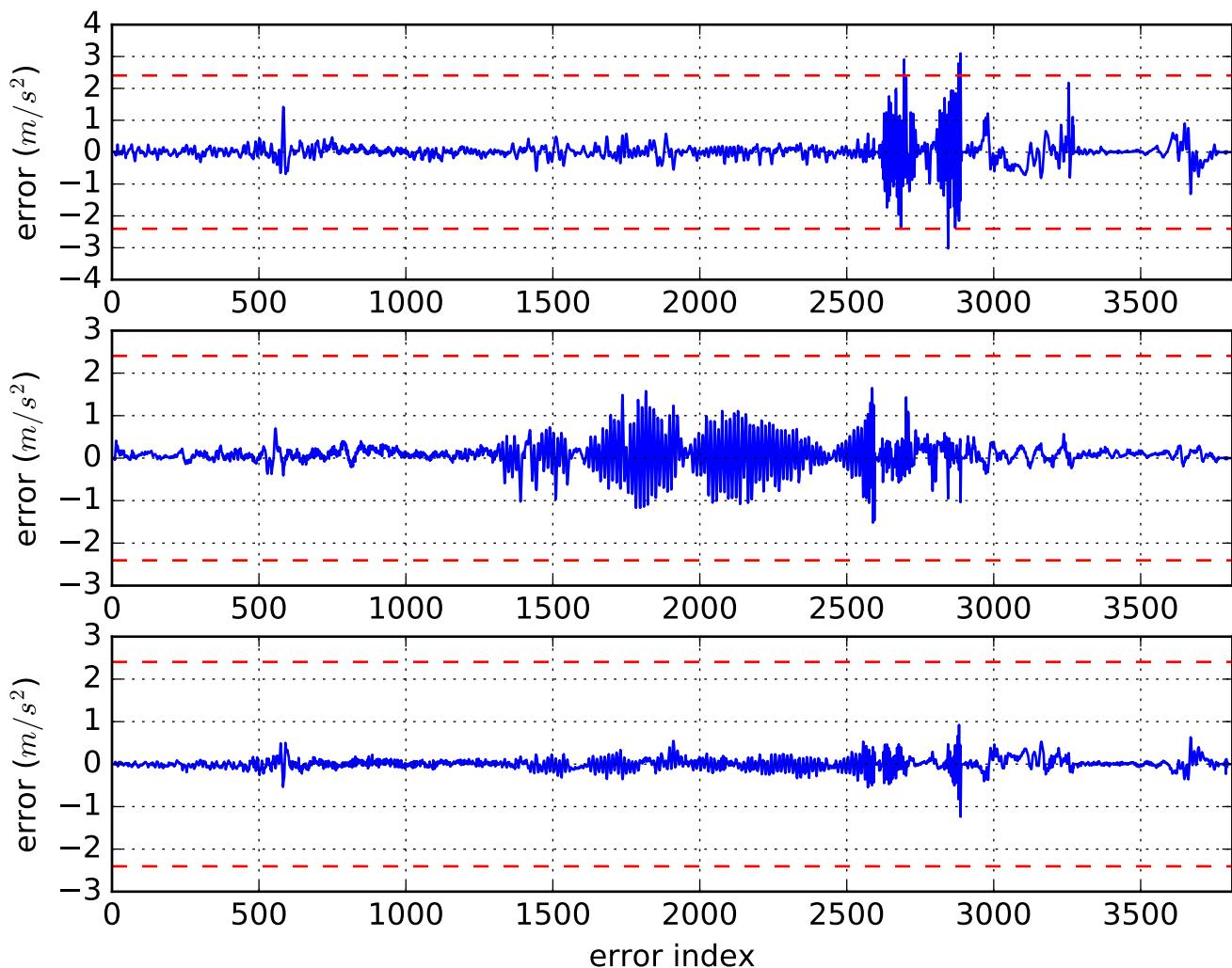
 [0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

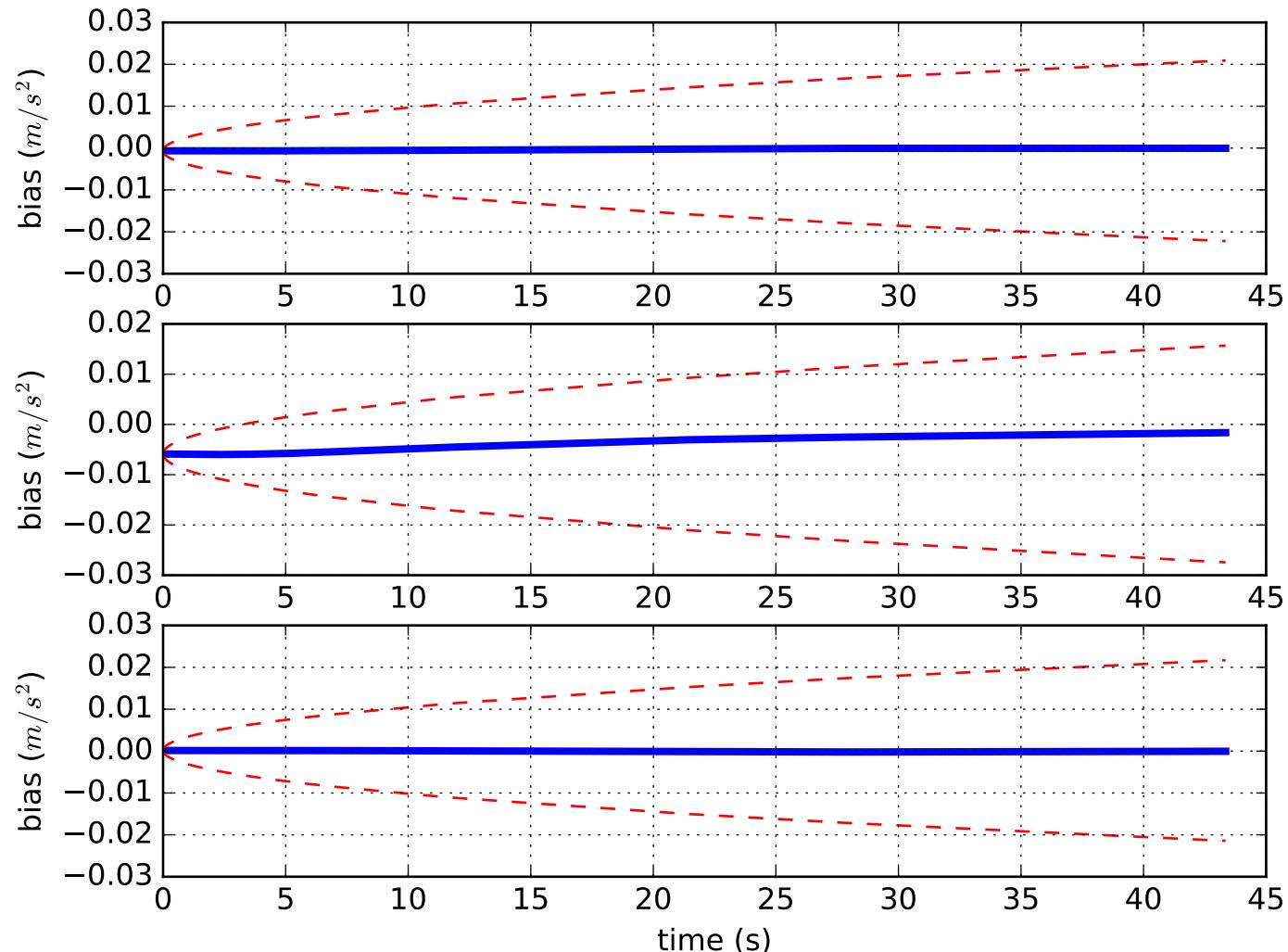
Comparison of predicted and measured specific force (imu0 frame)



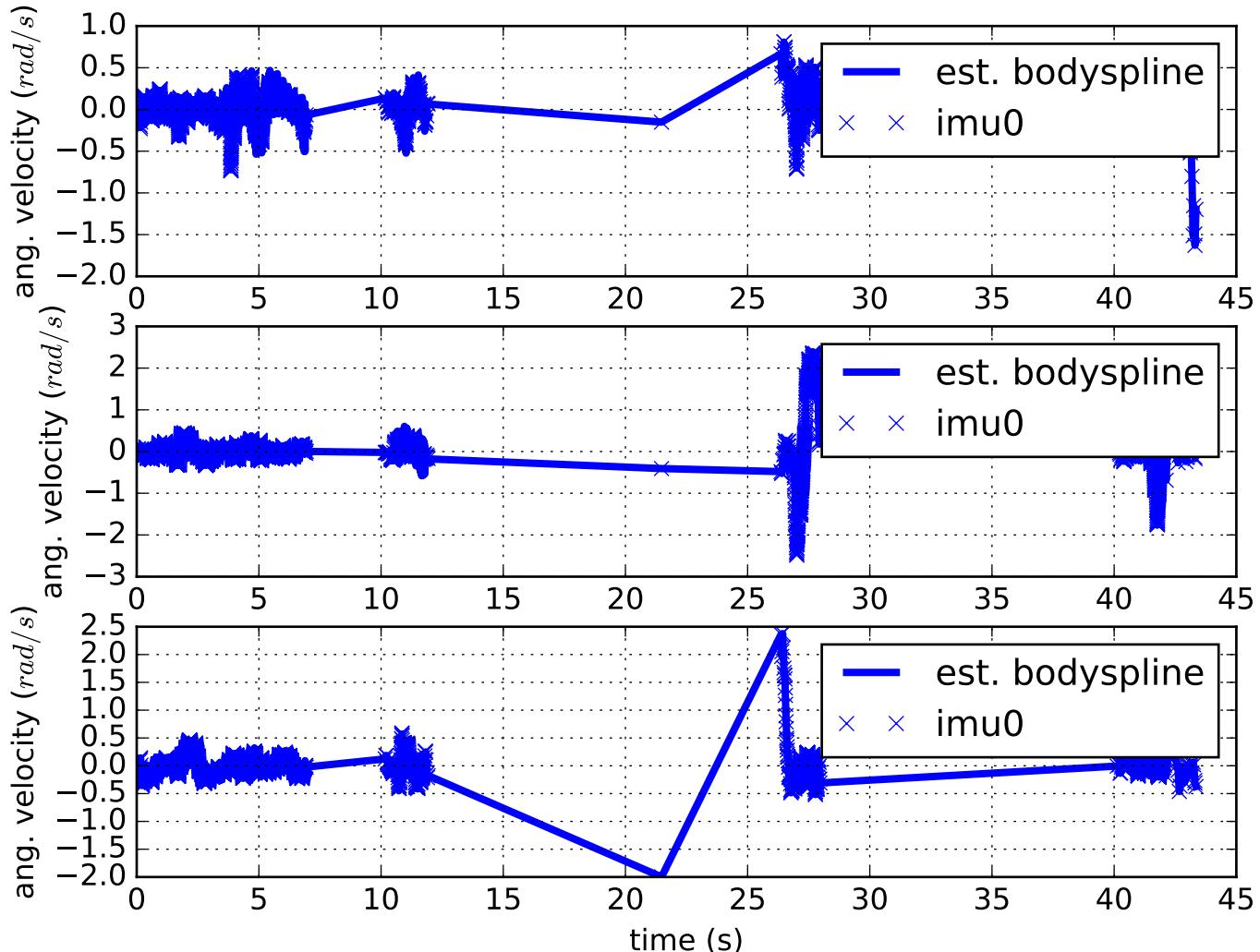
imu0: acceleration error



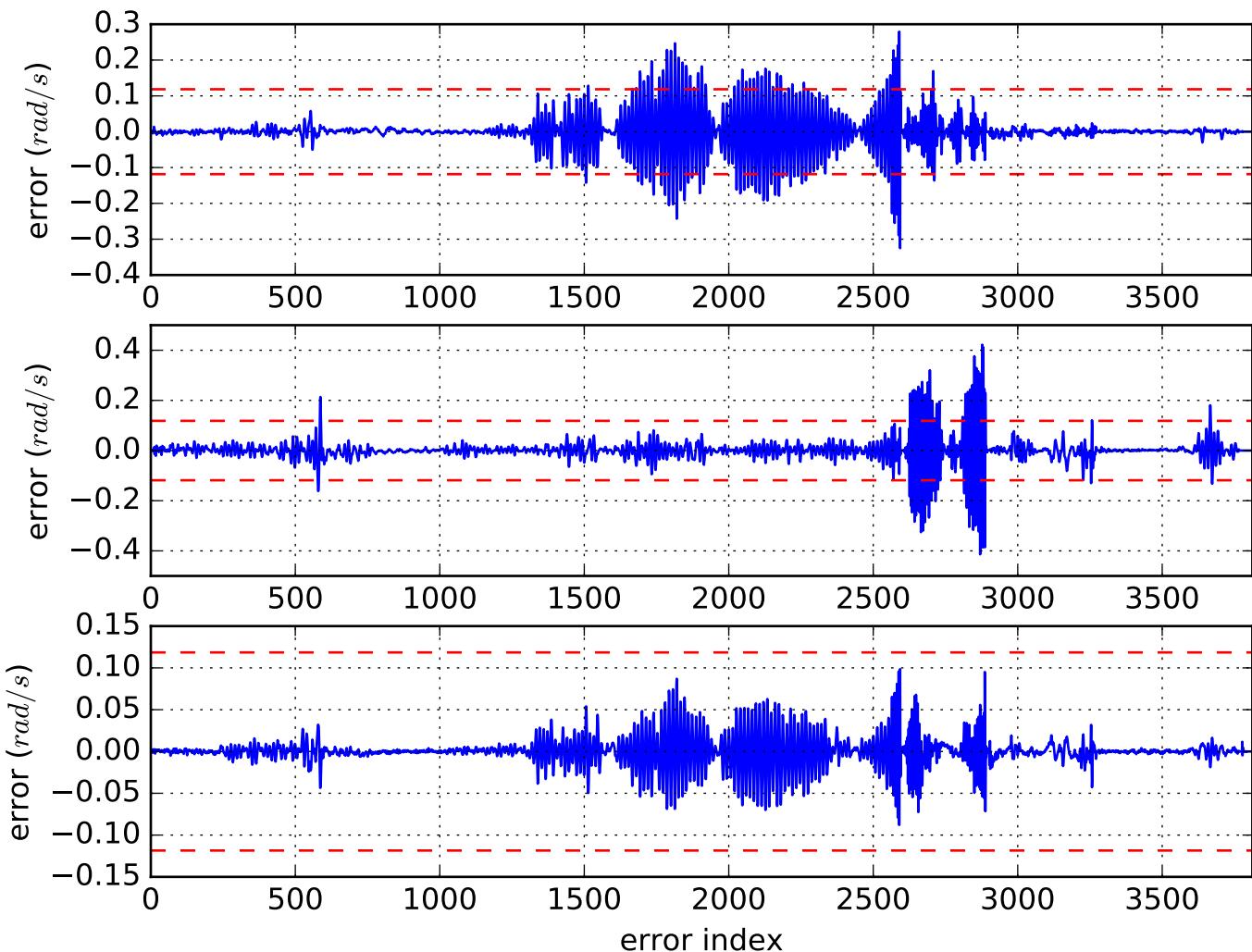
imu0: estimated accelerometer bias (imu frame)



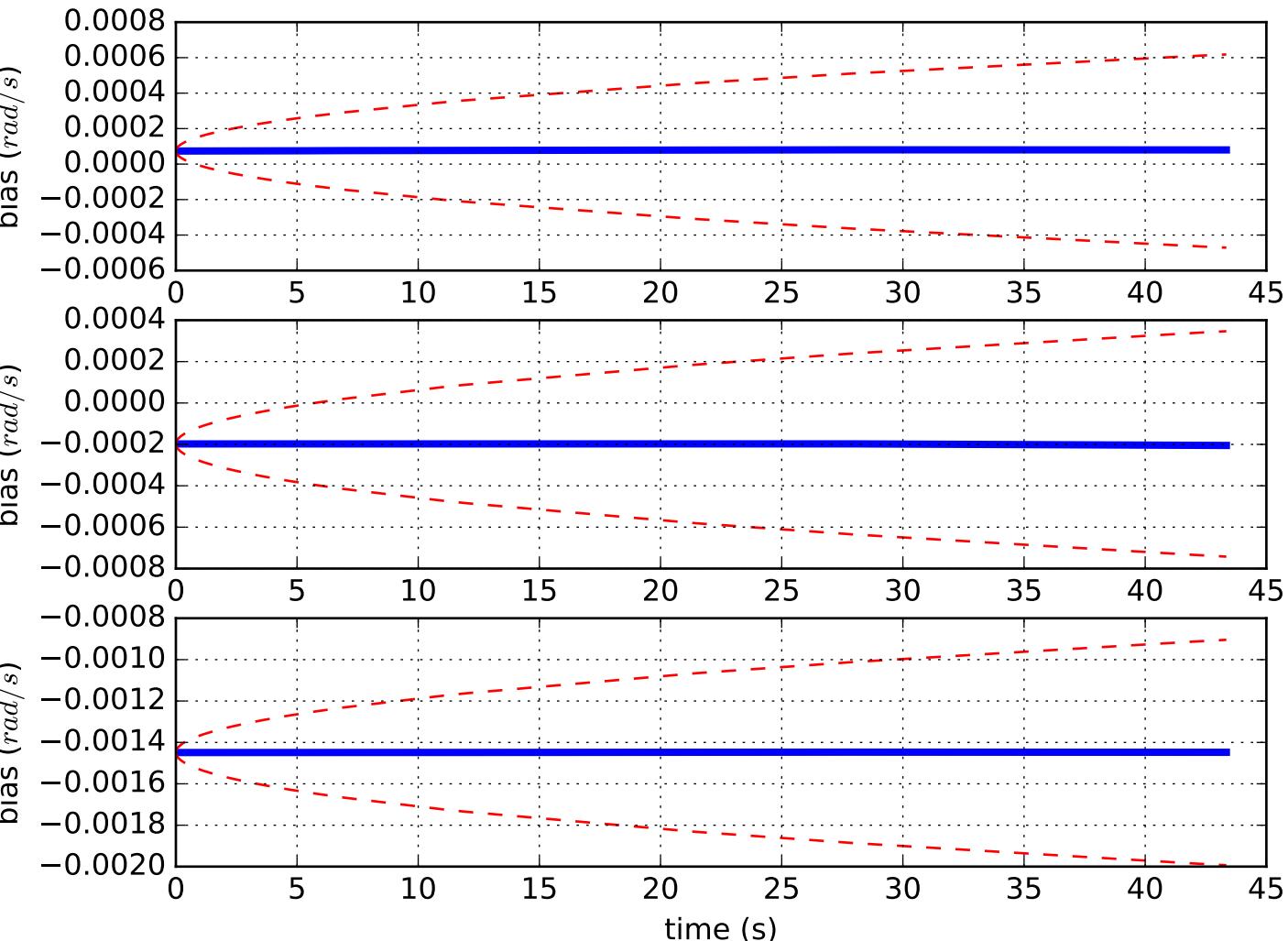
Comparison of predicted and measured angular velocities (body frame)



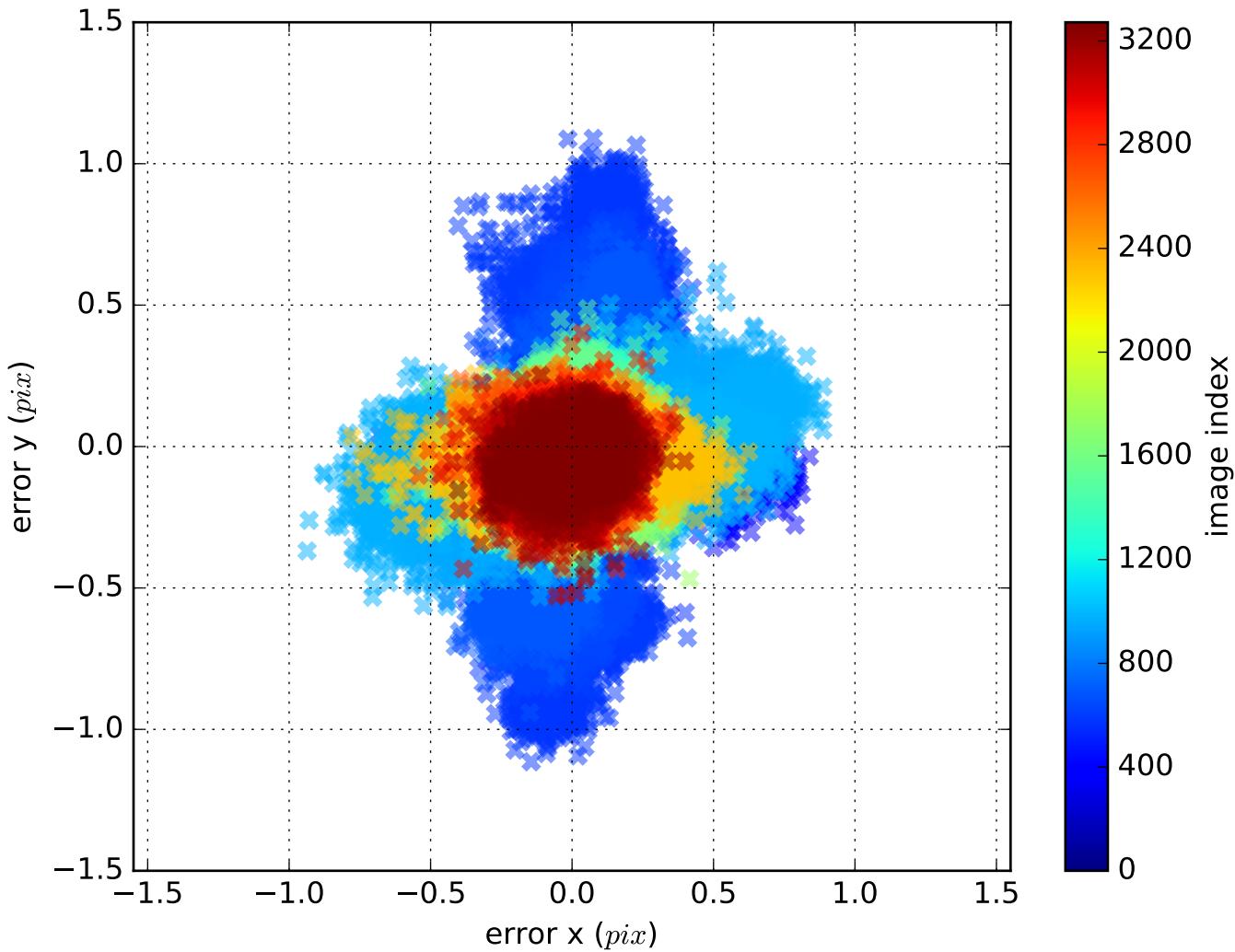
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

