

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 0.372784386751, median 0.314372357724, std: 0.256206183355
Reprojection error (cam1): mean 0.39228421131, median 0.332710314457, std: 0.2649839455
Gyroscope error (imu0): mean 1.09400690827, median 0.986235647742, std: 0.604905347869
Accelerometer error (imu0): mean 1.40338782556, median 1.23214504667, std: 0.901845987411

Residuals

Reprojection error (cam0) [px]: mean 0.372784386751, median 0.314372357724, std: 0.256206183355
Reprojection error (cam1) [px]: mean 0.39228421131, median 0.332710314457, std: 0.2649839455
Gyroscope error (imu0) [rad/s]: mean 0.00262522008181, median 0.00236660811579, std: 0.00145155360063
Accelerometer error (imu0) [m/s^2]: mean 0.0396938019236, median 0.0348503247162, std: 0.0255080565314

Transformation (cam0):

T_ci: (imu0 to cam0):

```
[[ 0.01486459  0.99970754 -0.01907583  0.06877196]
 [-0.99988793  0.0148958  0.00149499 -0.01582825]
 [ 0.0017787  0.01905147  0.99981692 -0.00585063]
 [ 0.         0.         0.         1.        ]]
```

T_ic: (cam0 to imu0):

```
[[ 0.01486459 -0.99988793  0.0017787 -0.01683833]
 [ 0.99970754  0.0148958  0.01905147 -0.06840461]
 [-0.01907583  0.00149499  0.99981692  0.00718511]
 [ 0.         0.         0.         1.        ]]
```

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

0.0

Transformation (cam1):

T_ci: (imu0 to cam1):

```
[[ 0.0126688  0.99971006 -0.020477  -0.04134474]
 [-0.99979283  0.01299082  0.0156699 -0.01532394]
 [ 0.01593137  0.02027423  0.99966752 -0.00614911]
```

[0. 0. 0. 1.]]

T_ic: (cam1 to imu0):

[[0.0126688 -0.99979283 0.01593137 -0.01469901]
[0.99971006 0.01299082 0.02027423 0.04165649]
[-0.020477 0.0156699 0.99966752 0.00554058]
[0. 0. 0. 1.]]

timeshift cam1 to imu0: [s] (t_imu = t_cam + shift)
0.0

Baselines:

Baseline (cam0 to cam1):

[[0.99999661 0.00219348 -0.00140477 -0.11008997]
[-0.00217341 0.99989772 0.01413619 0.00073487]
[0.00143563 -0.01413309 0.99989909 -0.0006215]
[0. 0. 0. 1.]]

baseline norm: 0.110094173243 [m]

Gravity vector in target coords: [m/s^2]
[-0.0113464 -9.55705324 -2.19795986]

Calibration configuration

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cam0

Camera model: pinhole

Focal length: [459.94595212723704, 458.66307696353005]

Principal point: [365.46321765791424, 248.91834629421038]

Distortion model: equidistant

Distortion coefficients: [-0.00793776584994515, 0.04792635926725132, -0.07177224004738512, 0.037206689383793096]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.088 [m]

Spacing 0.0264 [m]

cam1

Camera model: pinhole

Focal length: [458.41023371809104, 457.0984532140681]

Principal point: [379.02761343846583, 255.56888574036307]

Distortion model: equidistant

Distortion coefficients: [0.003912119018448976, 0.004529756469675778, -0.00981111761799609, 0.008859273566432044]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.088 [m]

Spacing 0.0264 [m]

IMU configuration

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IMU0:

Model: calibrated

Update rate: 200.0

Accelerometer:

Noise density: 0.002

Noise density (discrete): 0.0282842712475

Random walk: 0.003

Gyroscope:

Noise density: 0.00016968

Noise density (discrete): 0.00239963757263

Random walk: 1.9393e-05

T_i_b

[[1. 0. 0. 0.]

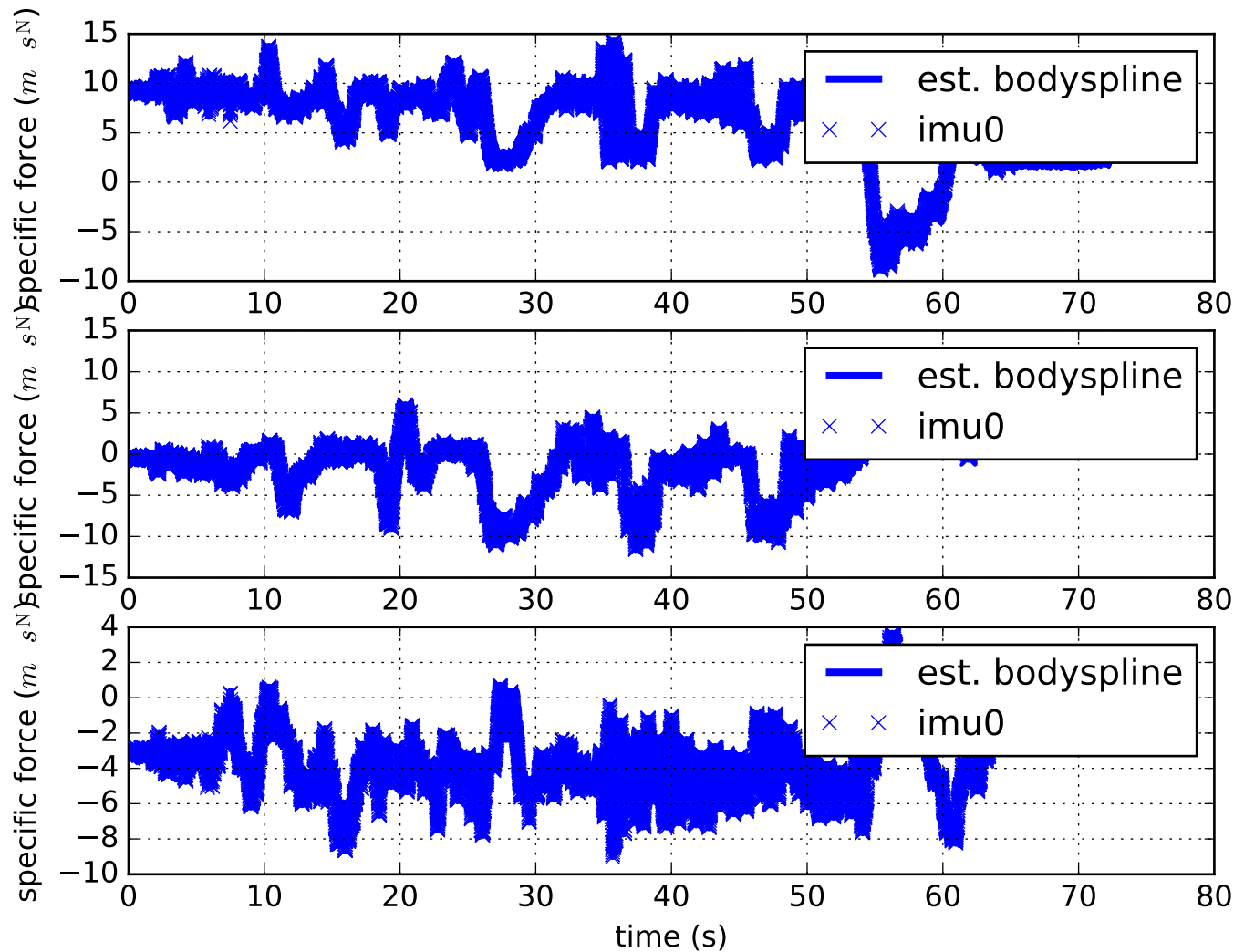
[0. 1. 0. 0.]

[0. 0. 1. 0.]

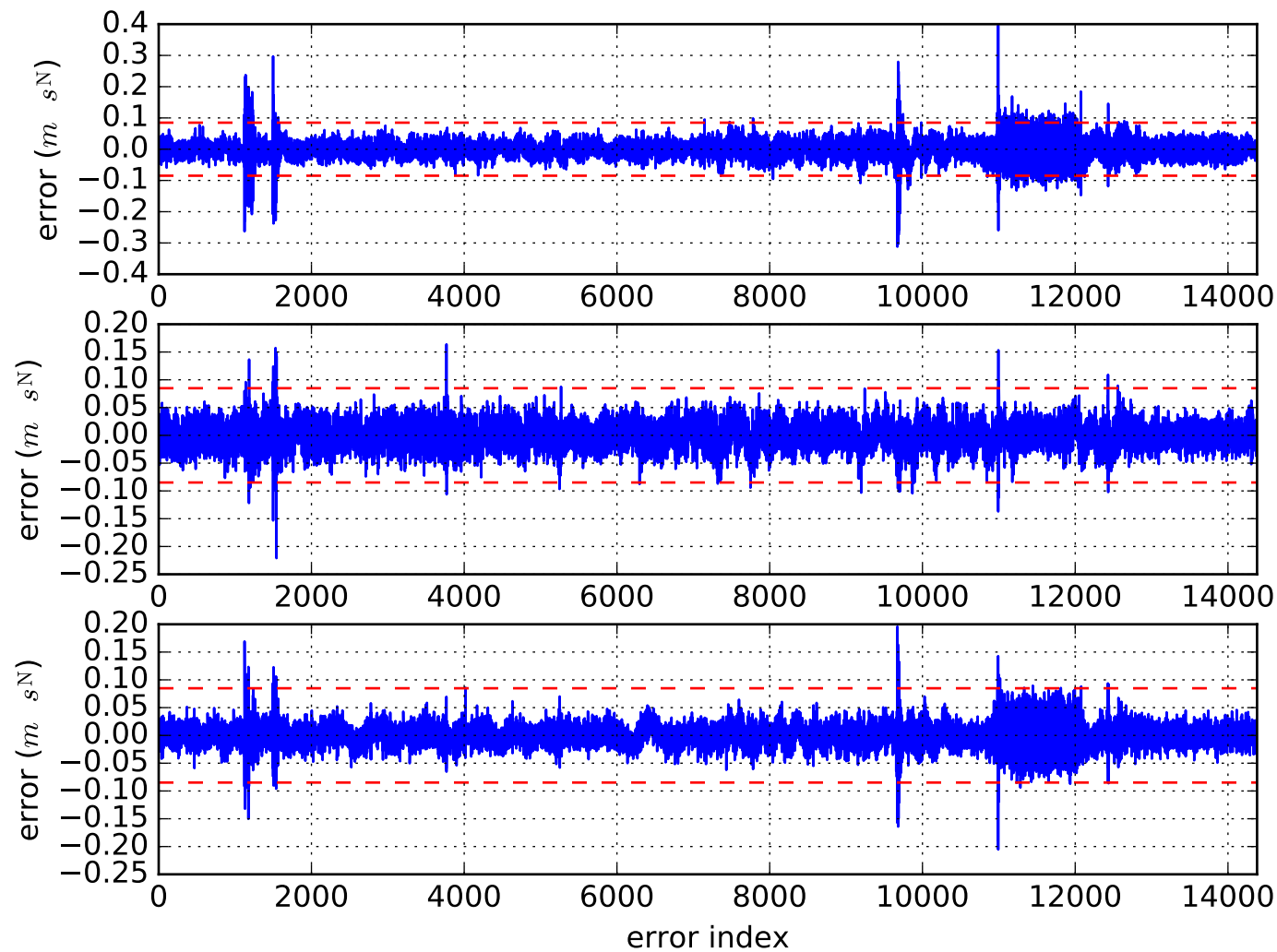
[0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

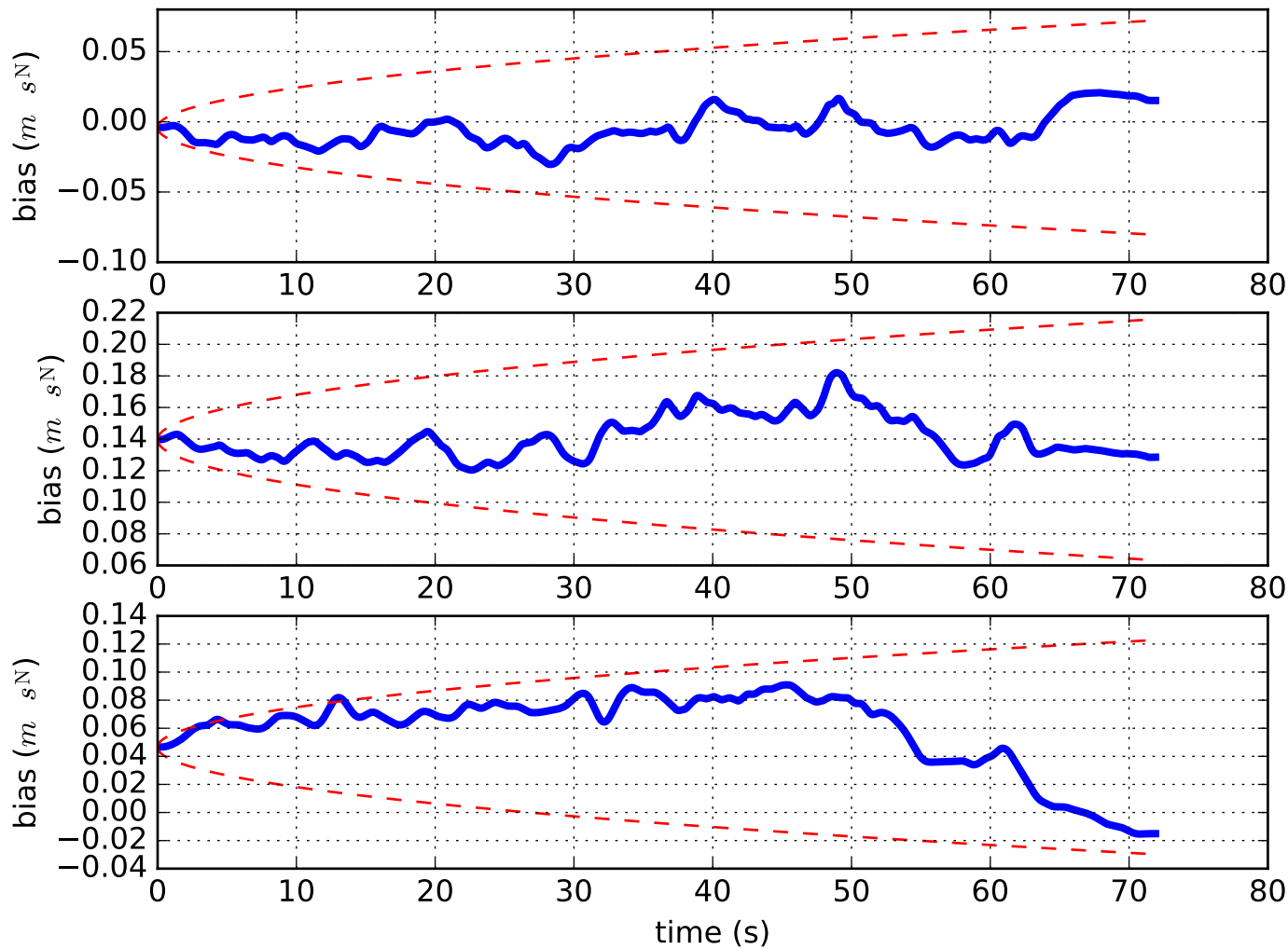
Comparison of predicted and measured specific force (imu0 frame)



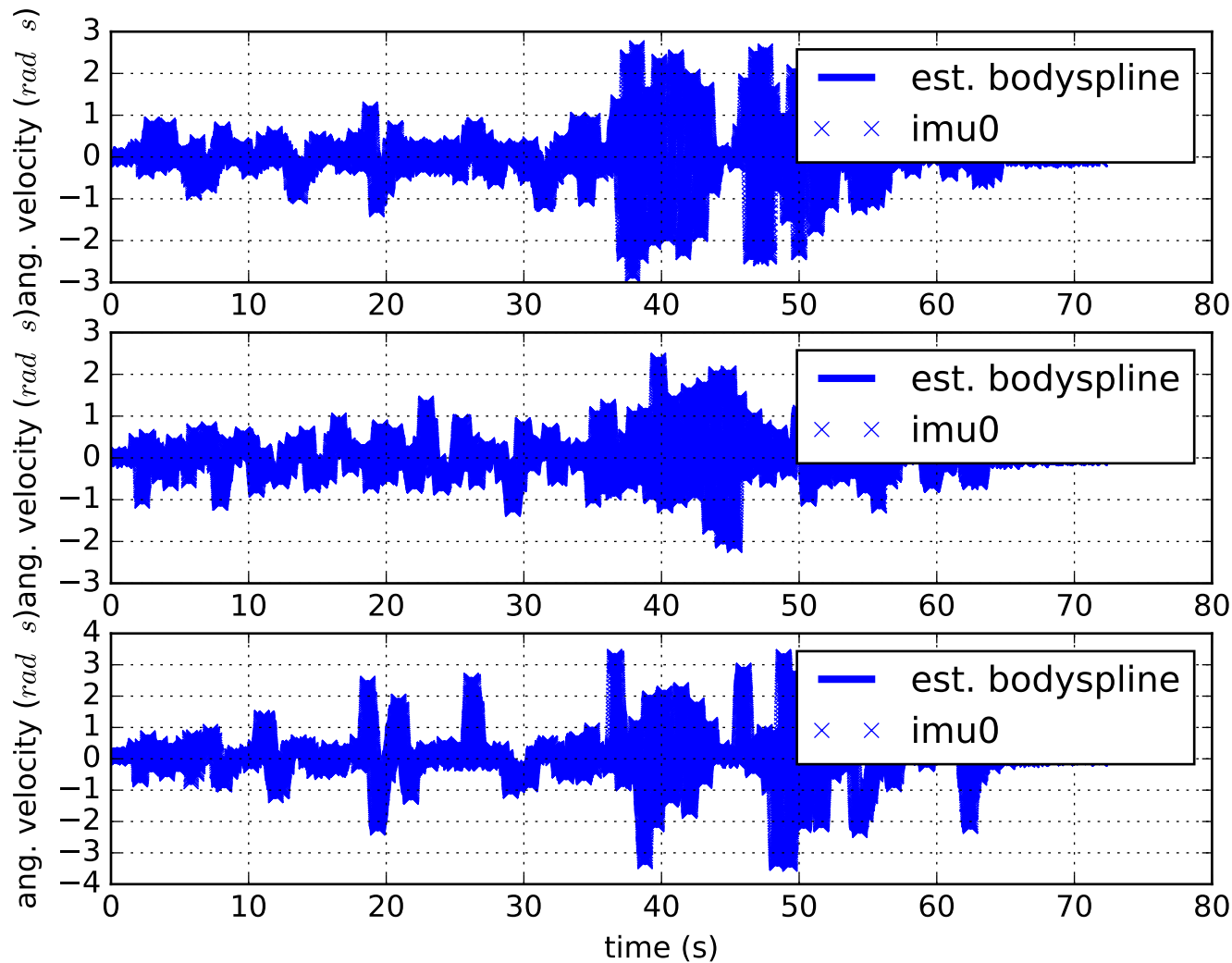
imu0: acceleration error



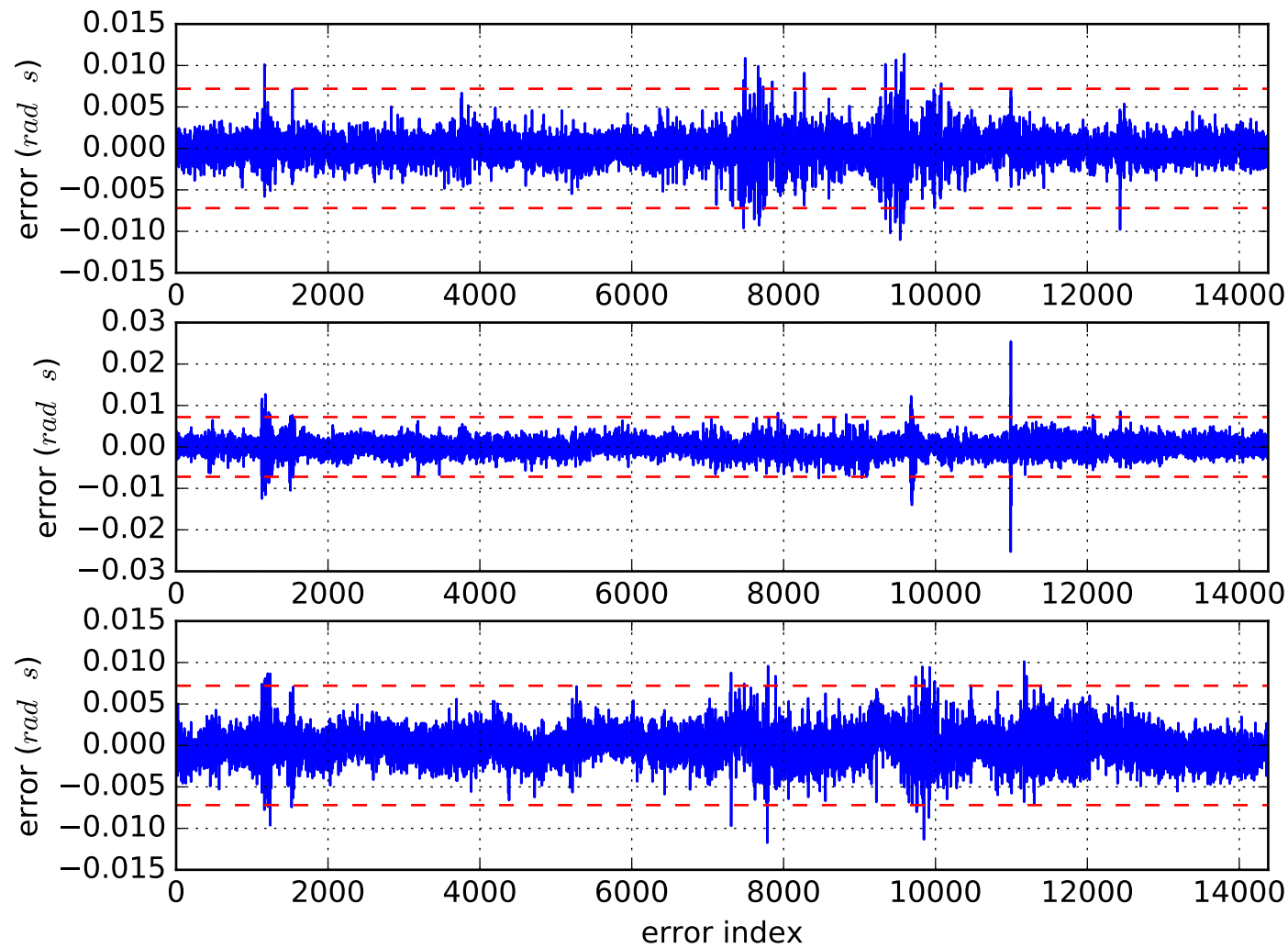
imu0: estimated accelerometer bias (imu frame)



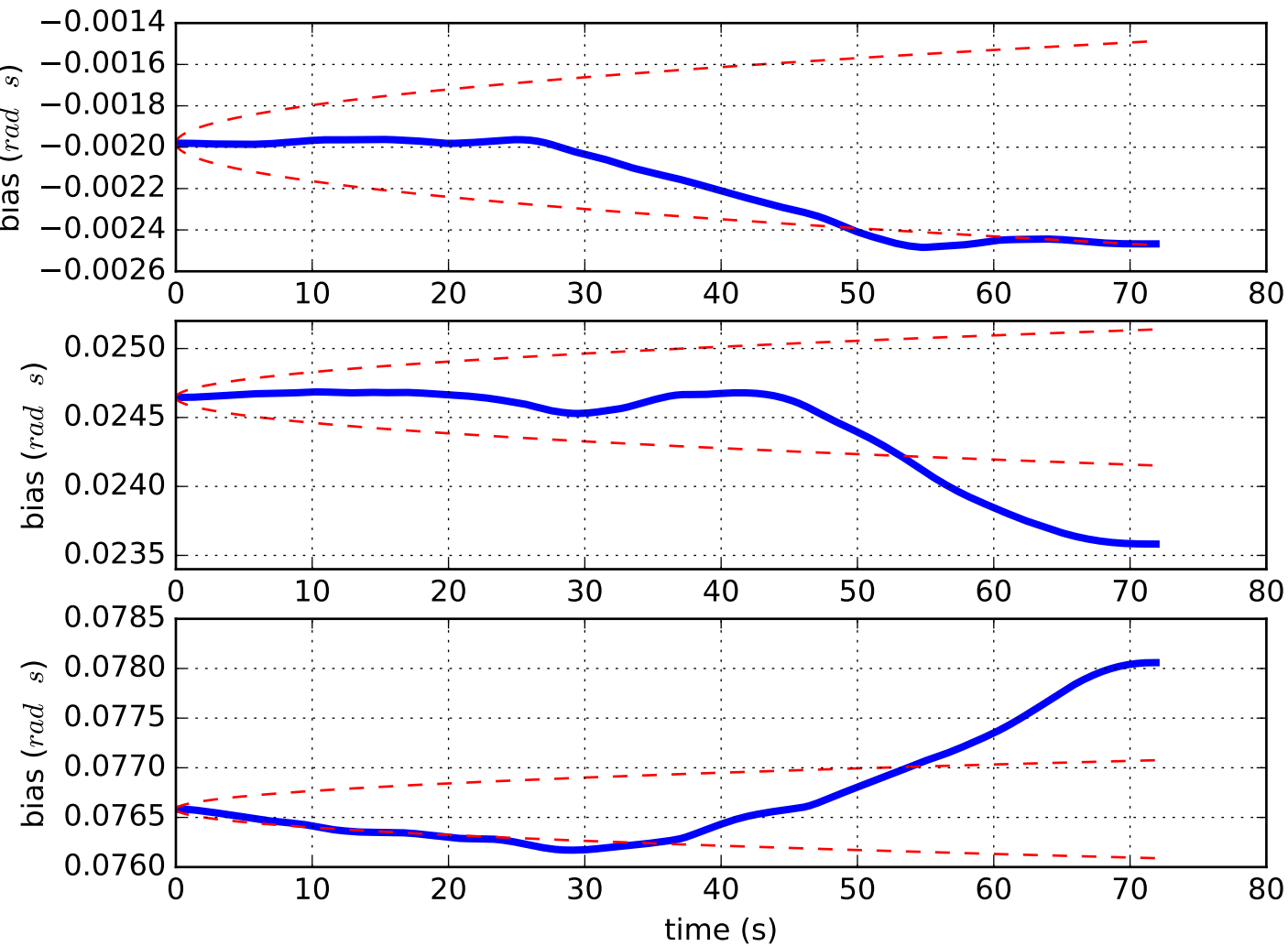
Comparison of predicted and measured angular velocities (body frame)



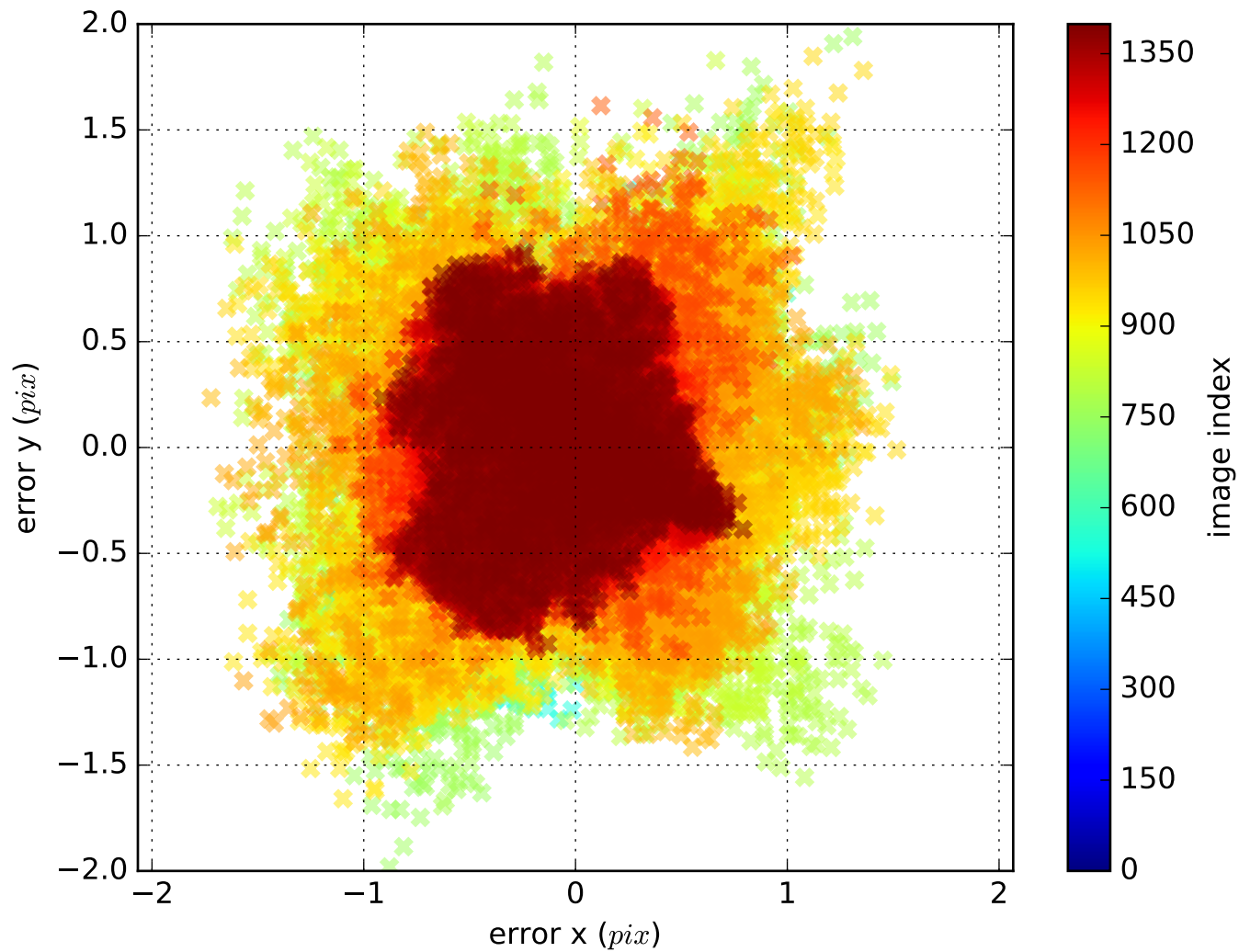
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

