

Calibration results

Normalized Residuals

Reprojection error (cam0): mean 0.382937356255, median 0.326352710664, std: 0.271204565272
Reprojection error (cam1): mean 0.394353535336, median 0.334500401025, std: 0.276927887619
Gyroscope error (imu0): mean 0.0991863399314, median 0.0874303328153, std: 0.0594685489672
Accelerometer error (imu0): mean 0.355896049137, median 0.322883236334, std: 0.200569060805

Residuals

Reprojection error (cam0) [px]: mean 0.382937356255, median 0.326352710664, std: 0.271204565272
Reprojection error (cam1) [px]: mean 0.394353535336, median 0.334500401025, std: 0.276927887619
Gyroscope error (imu0) [rad/s]: mean 0.00701353335666, median 0.00618225812151, std: 0.0042050614242
Accelerometer error (imu0) [m/s^2]: mean 0.0503313019484, median 0.0456625851887, std: 0.0283647485982

Transformation (cam0):

T_ci: (imu0 to cam0):

```
[[ 0.01463845  0.99968038 -0.02061202  0.06603641]
 [-0.99987181  0.01476877  0.00618425 -0.01406328]
 [ 0.00648669  0.02051885  0.99976842 -0.001749 ]
 [ 0.          0.          0.          1.        ]]
```

T_ic: (cam0 to imu0):

```
[[ 0.01463845 -0.99987181  0.00648669 -0.0150168 ]
 [ 0.99968038  0.01476877  0.02051885 -0.06577171]
 [-0.02061202  0.00618425  0.99976842  0.00319671]
 [ 0.          0.          0.          1.        ]]
```

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

-6.39990815087e-05

Transformation (cam1):

T_ci: (imu0 to cam1):

```
[[ 0.01227784  0.99973596 -0.01942355 -0.0439197 ]
 [-0.99971405  0.01267157  0.02027939 -0.0139551 ]
 [ 0.02052016  0.01916901  0.99960566 -0.00180193]
```

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

T_ic: (cam1 to imu0):

```
[[ 0.01227784 -0.99971405  0.02052016 -0.01337489]
 [ 0.99973596  0.01267157  0.01916901  0.04411948]
 [-0.01942355  0.02027939  0.99960566  0.00123114]
 [ 0.      0.      0.      1.      ]]
```

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

```
-5.82126749194e-05
```

Baselines:

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Baseline (cam0 to cam1):

```
[[ 0.99999651  0.00236848  0.00117402 -0.10992052]
 [-0.00238474  0.99989845  0.01404986  0.00028881]
 [-0.00114062 -0.01405262  0.99990061 -0.00017541]
 [ 0.      0.      0.      1.      ]]
baseline norm: 0.109921035556 [m]
```

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

```
[-0.01586344 -9.55065545 -2.22556771]
```

Calibration configuration

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cam0

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Camera model: pinhole

Focal length: [460.2026582023472, 460.03280622995567]

Principal point: [364.6696989025347, 245.06524384456873]

Distortion model: radtan

Distortion coefficients: [-0.294912216660939, 0.08519390931620502, 0.0006007412419660653, -0.00013301096562213466]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.088 [m]

Spacing 0.0264 [m]

cam1

Camera model: pinhole

Focal length: [458.8576896940234, 458.68794170806575]

Principal point: [377.05381063481383, 251.95840989112463]

Distortion model: radtan

Distortion coefficients: [-0.2929097975426335, 0.0837519854227472, 0.0004544777981521998, -1.5752147686857926e-05]

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: 0.01

 Noise density (discrete): 0.141421356237

 Random walk: 0.0002

Gyroscope:

 Noise density: 0.005

 Noise density (discrete): 0.0707106781187

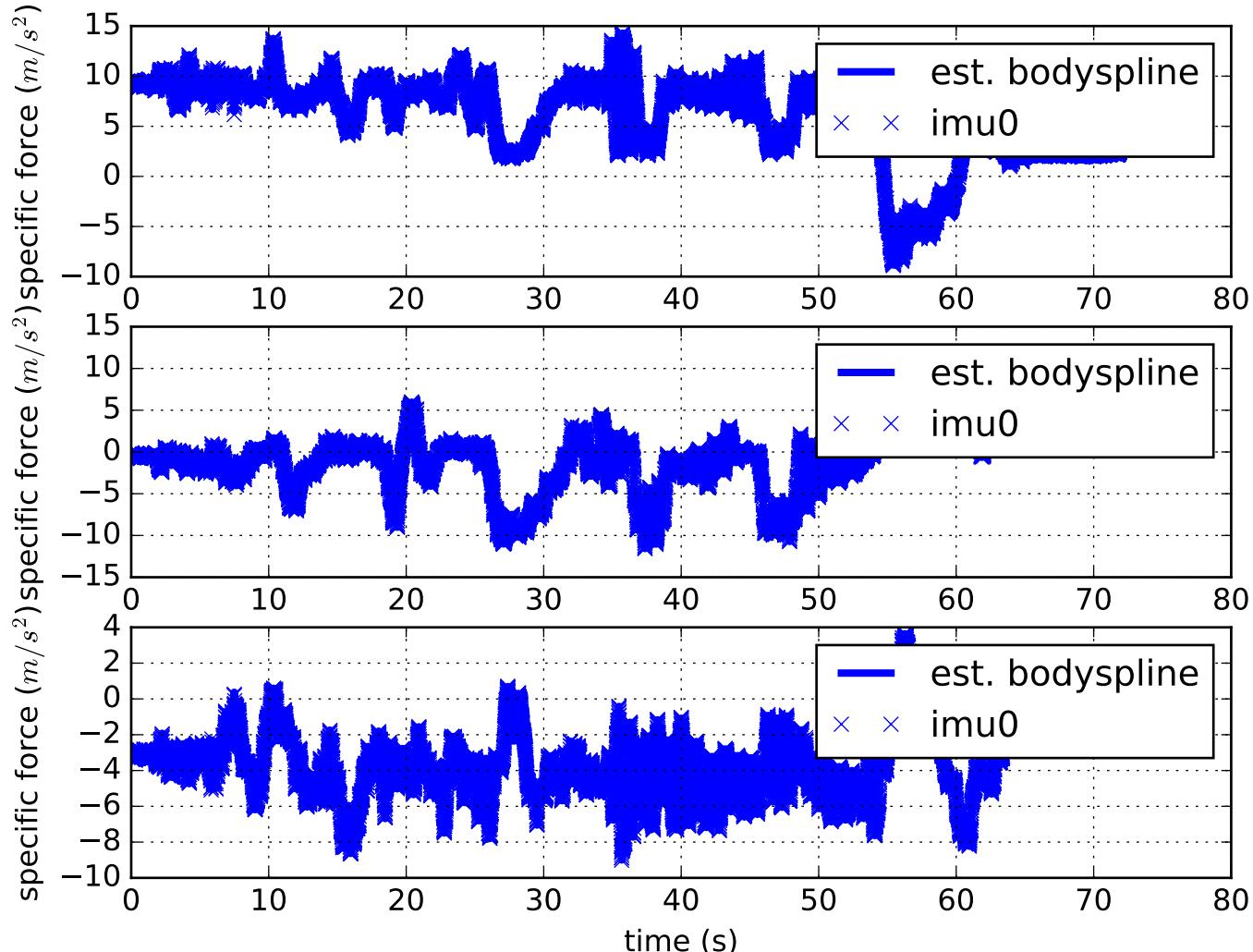
 Random walk: 4e-06

T_i_b

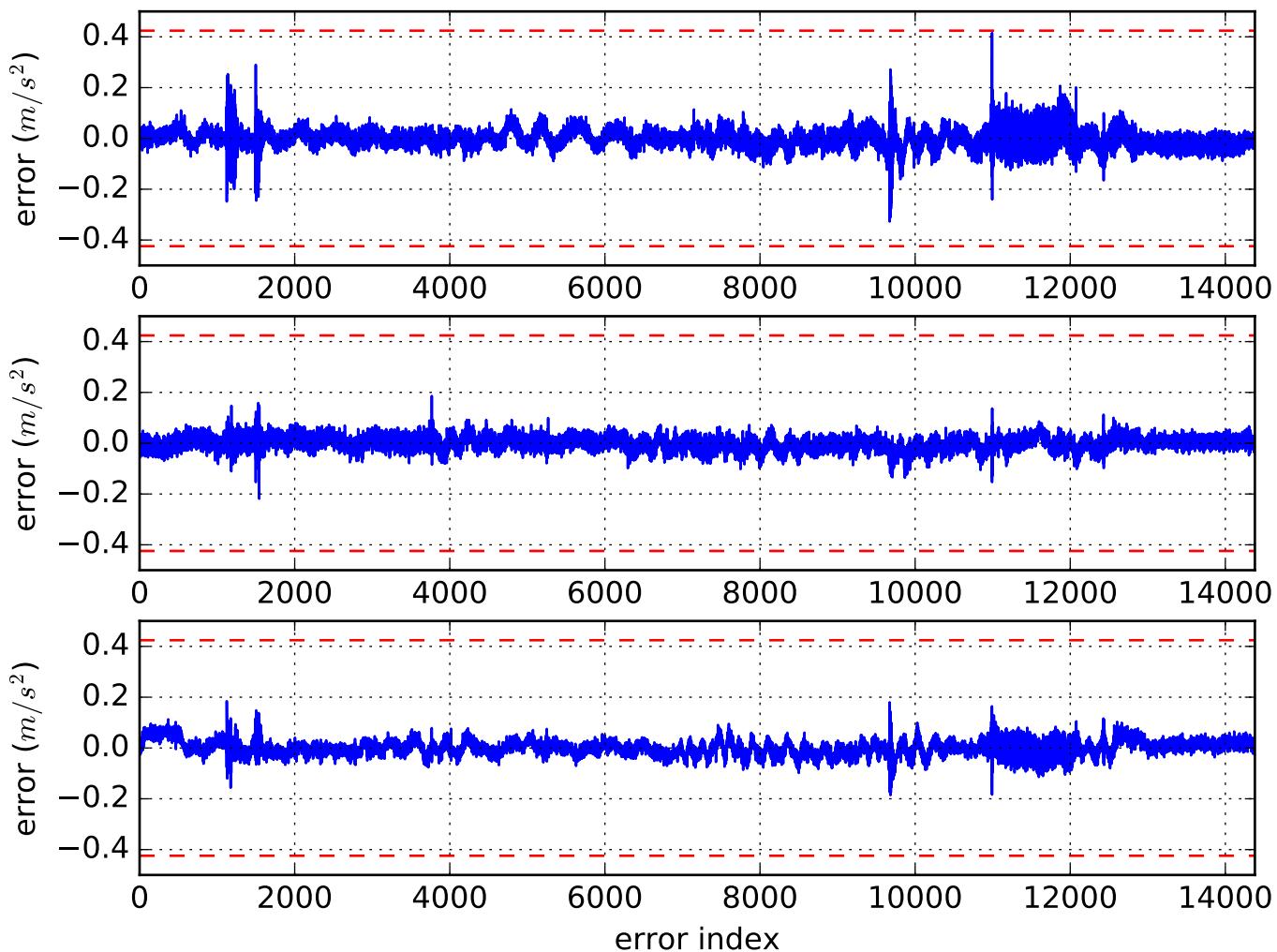
[[1. 0. 0. 0.]
[0. 1. 0. 0.]
[0. 0. 1. 0.]
[0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

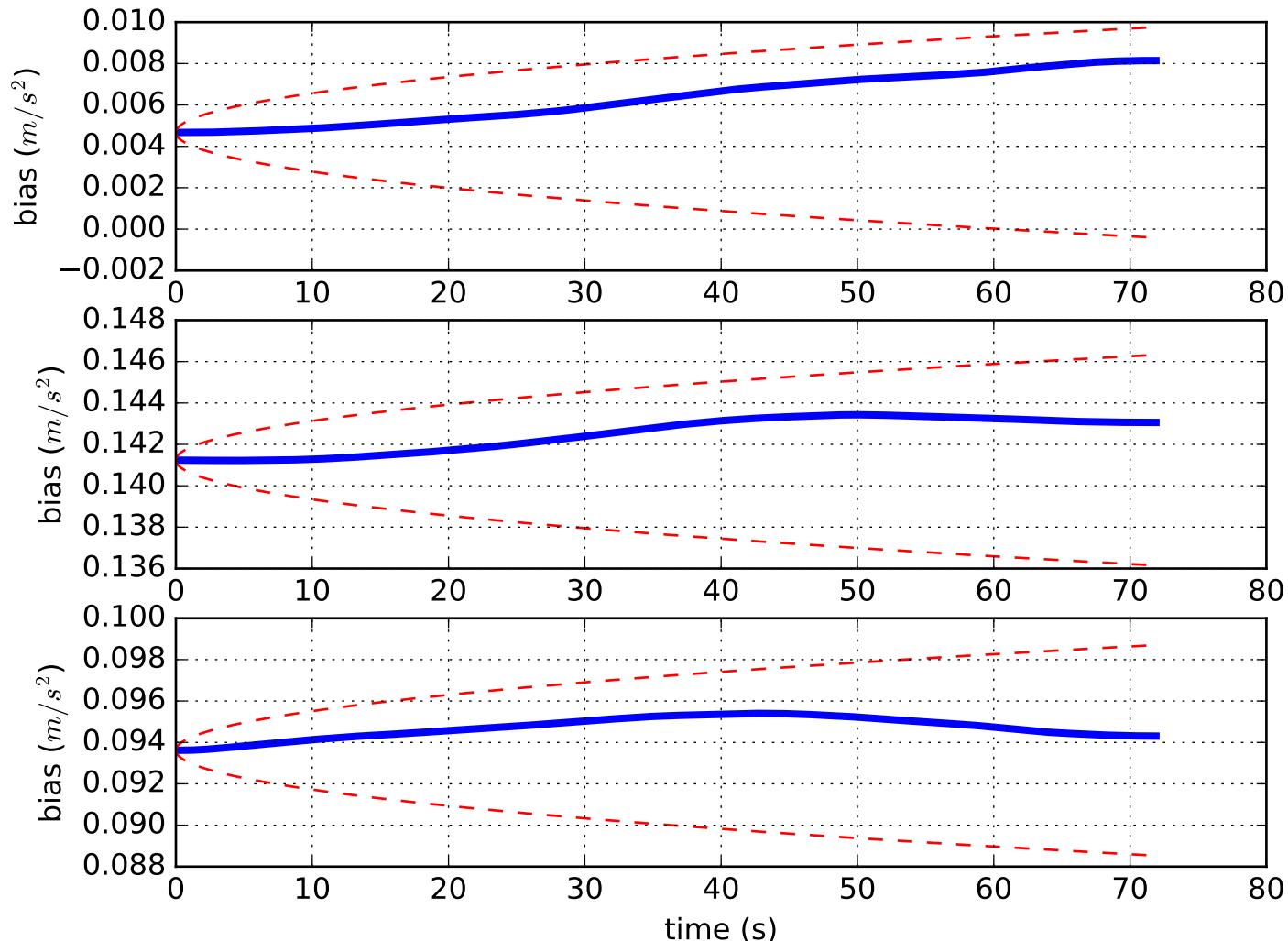
Comparison of predicted and measured specific force (imu0 frame)



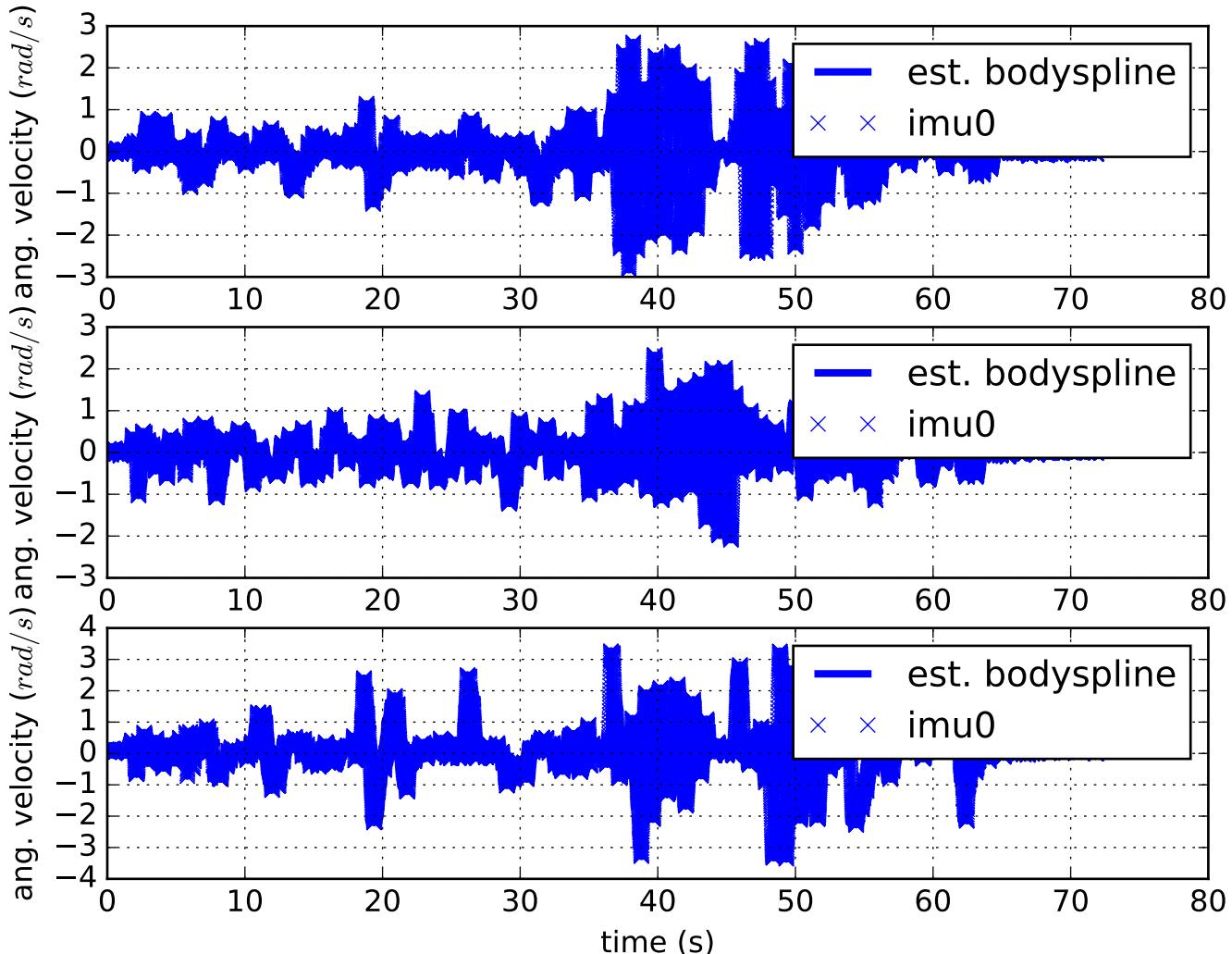
imu0: acceleration error



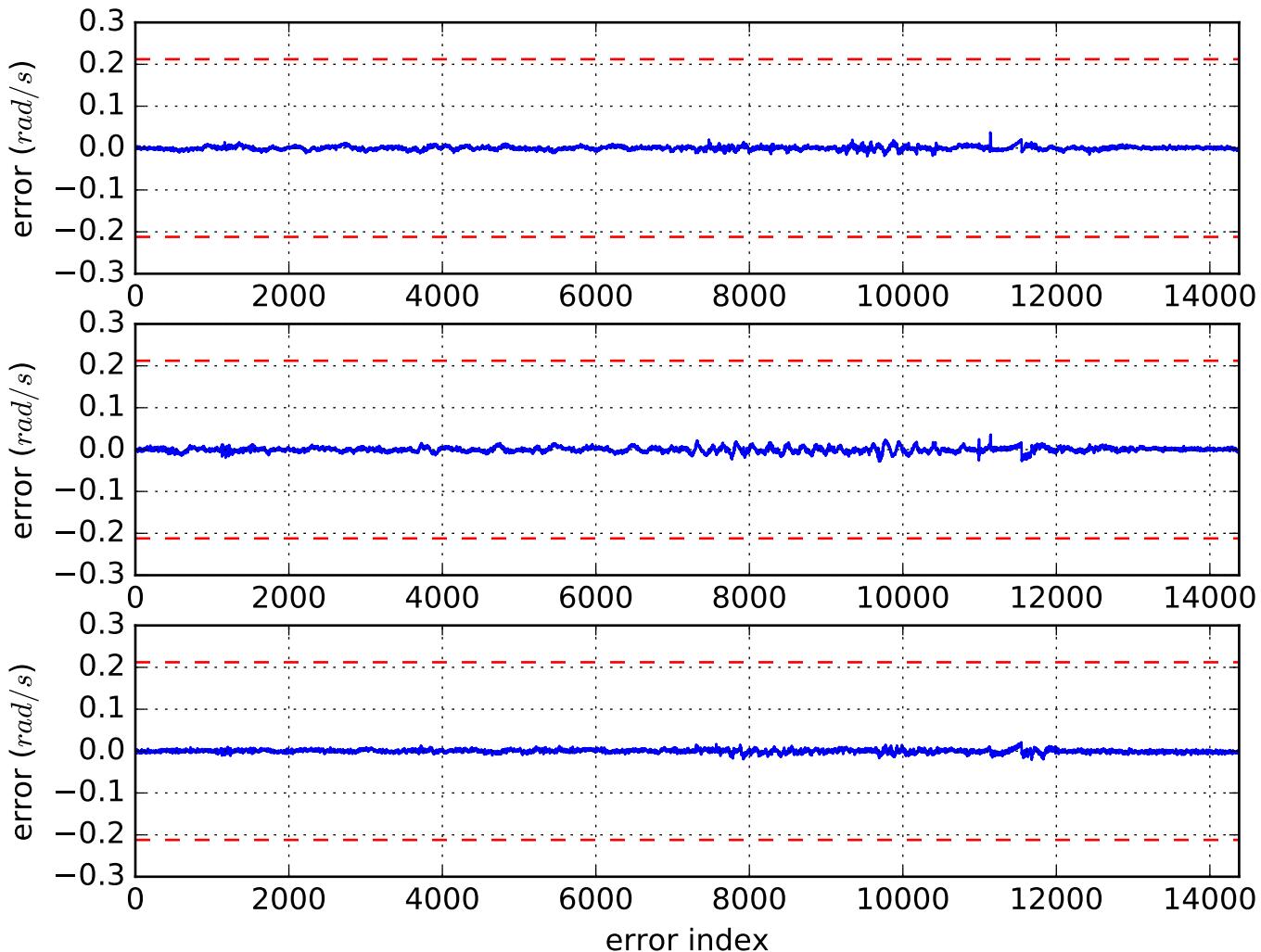
imu0: estimated accelerometer bias (imu frame)



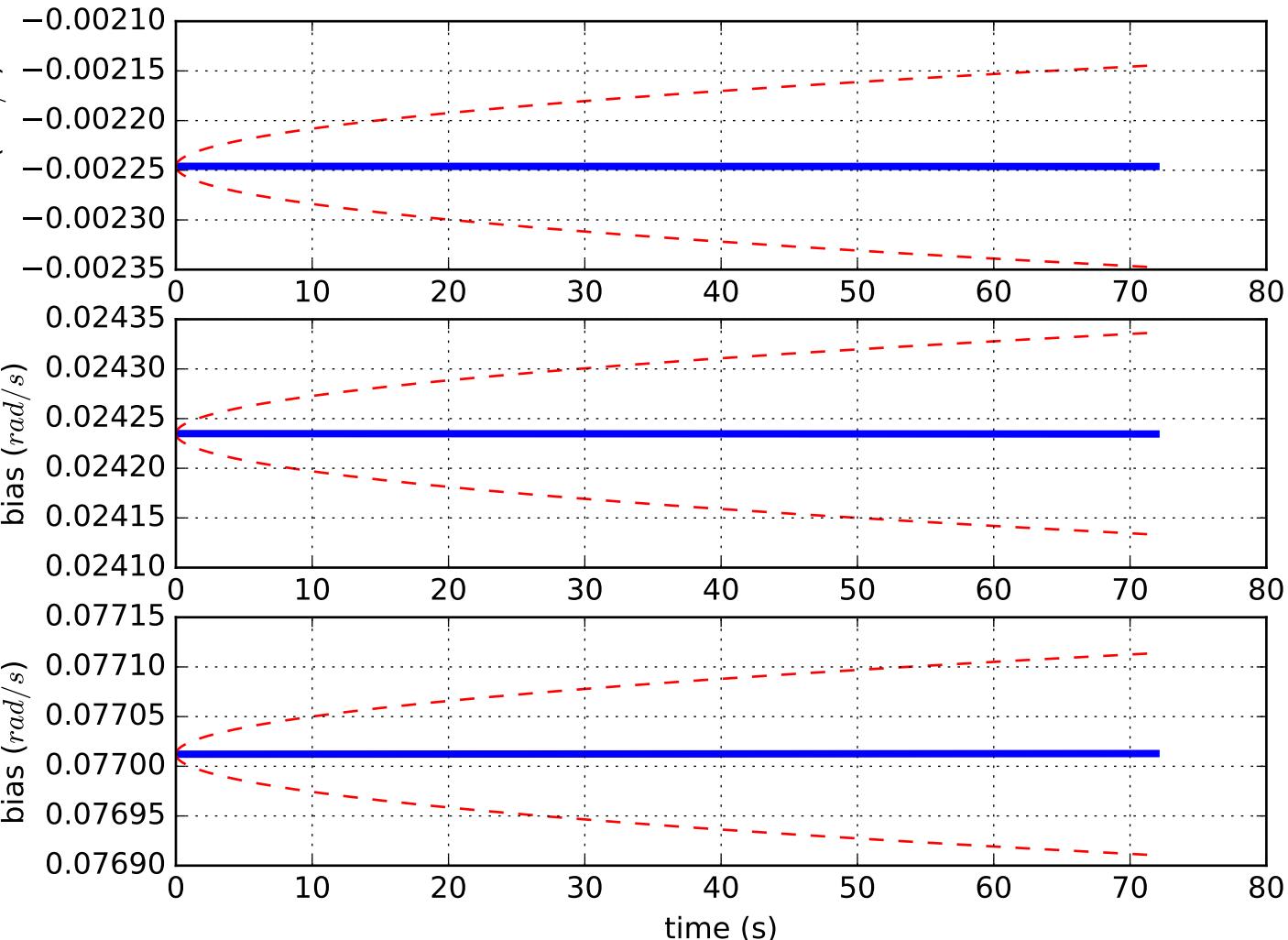
Comparison of predicted and measured angular velocities (body frame)



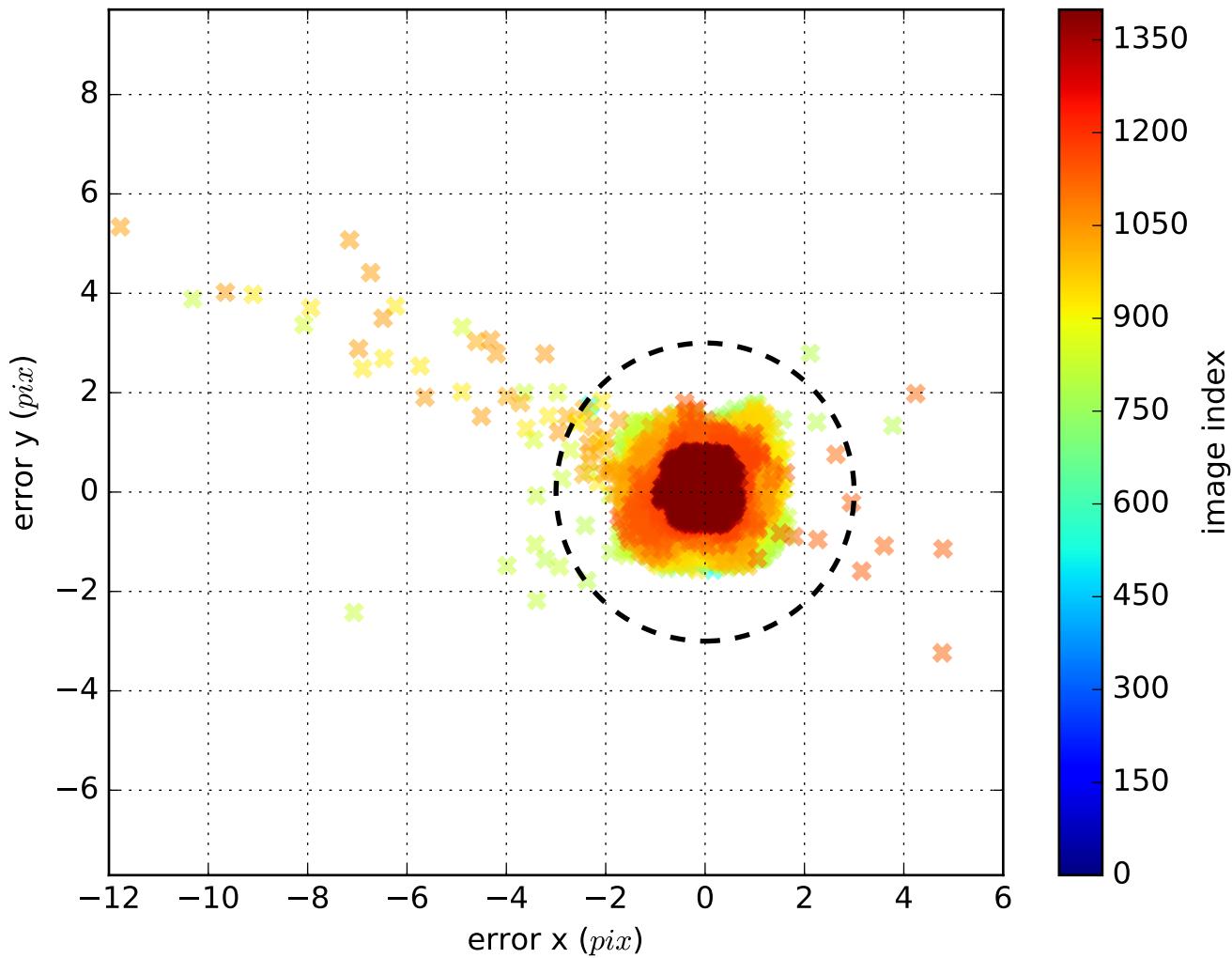
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

