

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 0.215882287977, median 0.185659139731, std: 0.14749326682

Reprojection error (cam1): mean 0.196810120752, median 0.175511908243, std: 0.12198118328

Gyroscope error (imu0): mean 1.26020198641, median 0.969977622242, std: 1.07579580465

Accelerometer error (imu0): mean 0.363538157862, median 0.271206342051, std: 0.316094581383

Residuals

Reprojection error (cam0) [px]: mean 0.215882287977, median 0.185659139731, std: 0.14749326682

Reprojection error (cam1) [px]: mean 0.196810120752, median 0.175511908243, std: 0.12198118328

Gyroscope error (imu0) [rad/s]: mean 0.0241675822216, median 0.018601790976, std: 0.0206311240921

Accelerometer error (imu0) [m/s^2]: mean 0.0820308017331, median 0.0611965296967, std: 0.0713253653668

Transformation (cam0):

T_ci: (imu0 to cam0):

[[-0.99997801 0.00539649 0.00385397 -0.08919312]
[0.00389471 0.0075596 0.99996384 0.01925989]
[0.00536716 0.99995686 -0.00758046 -0.2110859]
[0. 0. 0. 1.]]

T_ic: (cam0 to imu0):

[[-0.99997801 0.00389471 0.00536716 -0.08813323]
[0.00539649 0.0075596 0.99995686 0.21141252]
[0.00385397 0.99996384 -0.00758046 -0.02051557]
[0. 0. 0. 1.]]

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

0.0258582863543

Transformation (cam1):

T_ci: (imu0 to cam1):

[[-0.99994945 0.0100261 0.00075188 0.05692734]
[0.00086111 0.01089462 0.99994028 0.01925519]
[0.01001731 0.99989039 -0.0109027 -0.21348678]

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

T_ic: (cam1 to imu0):

```
[-0.99994945  0.00086111  0.01001731  0.05904644]  
[ 0.0100261   0.01089462  0.99989039  0.21268284]  
[ 0.00075188  0.99994028 -0.0109027   -0.02162442]  
[ 0.      0.      0.      1.      ]]
```

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

```
0.00546104191442
```

Baselines:

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Baseline (cam0 to cam1):

```
[[ 0.99998447 -0.00306687  0.00465308  0.14716034]  
[ 0.00305144  0.99998984  0.00331876  0.00096821]  
[-0.00466321 -0.00330451  0.99998367 -0.00275661]  
[ 0.      0.      0.      1.      ]]  
baseline norm: 0.147189335766 [m]
```

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

```
[-0.04992312 -9.68103302 -1.56317953]
```

Calibration configuration

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cam0

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Camera model: pinhole

Focal length: [587.0508100666408, 587.0256171950165]

Principal point: [366.4862441266279, 262.6511951947535]

Distortion model: radtan

Distortion coefficients: [-0.32951452323612973, 0.11714006852979723, -0.00015746991148458766, -0.001424989180152538]

Type: aprilgrid

Tags:

Rows: 7

Cols: 10

Size: 0.05 [m]

Spacing 0.015 [m]

cam1

Camera model: pinhole

Focal length: [587.9319688651238, 588.0855038237929]

Principal point: [355.0312739318984, 264.4215123281423]

Distortion model: radtan

Distortion coefficients: [-0.3278125857621454, 0.11634574520753388, -0.0002622680055085587, -5.645709552760193e-05]

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

Accelerometer:

Noise density: 0.0159555564986

Noise density (discrete): 0.225645643955

Random walk: 0.000293622394685

Gyroscope:

Noise density: 0.00135605731924

Noise density (discrete): 0.0191775465222

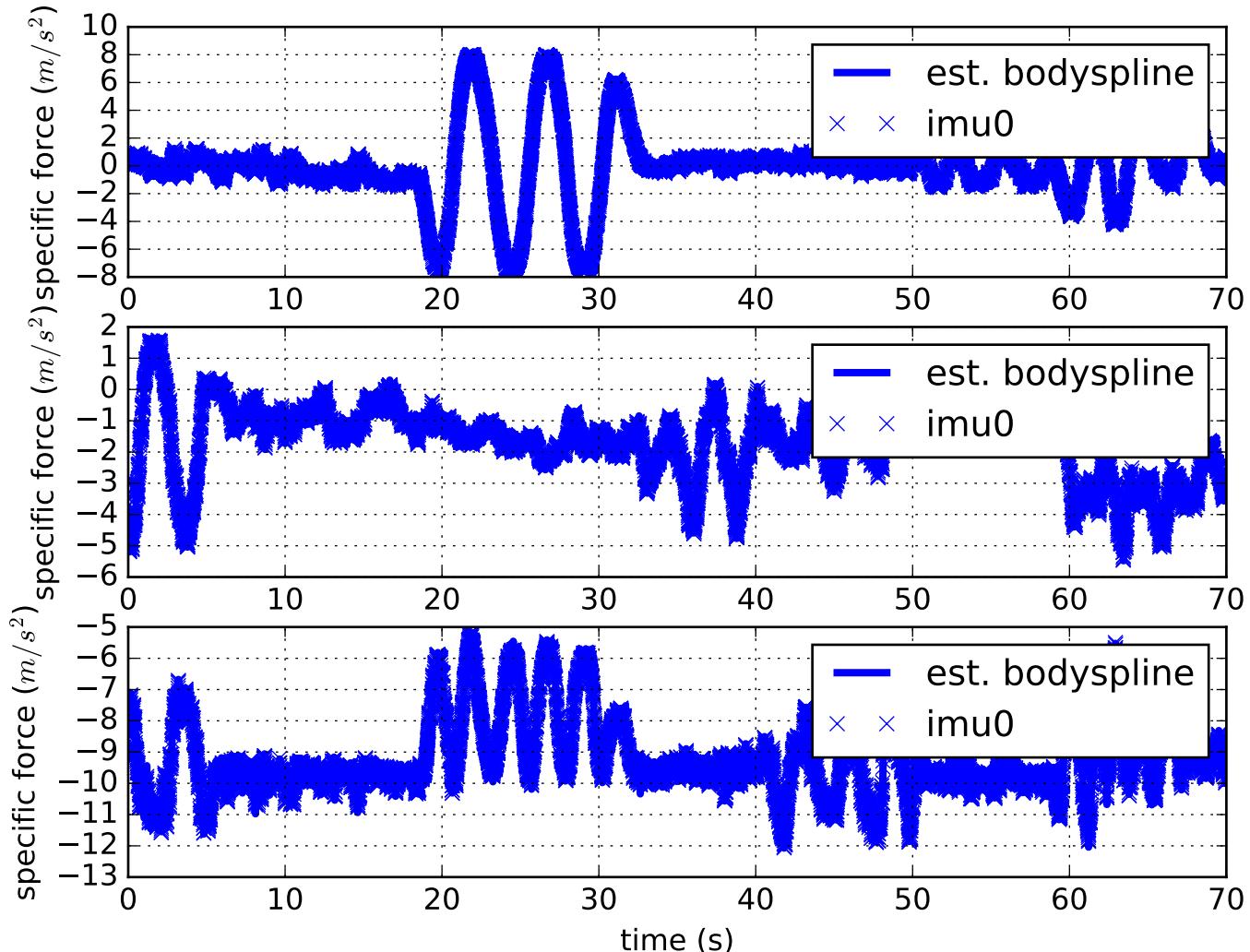
Random walk: 3.10938413455e-05

T_i_b

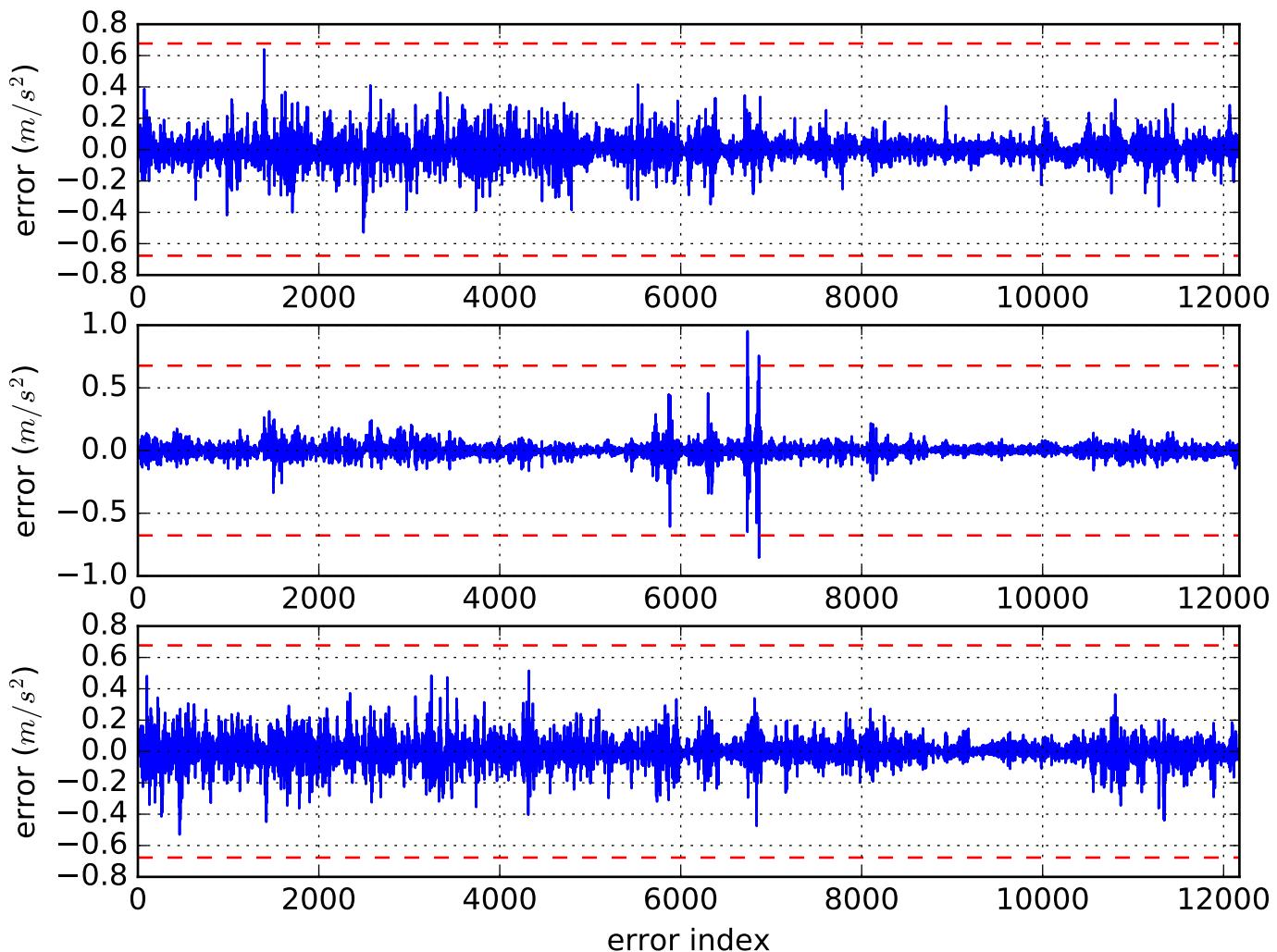
[[1. 0. 0. 0.]
[0. 1. 0. 0.]
[0. 0. 1. 0.]
[0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

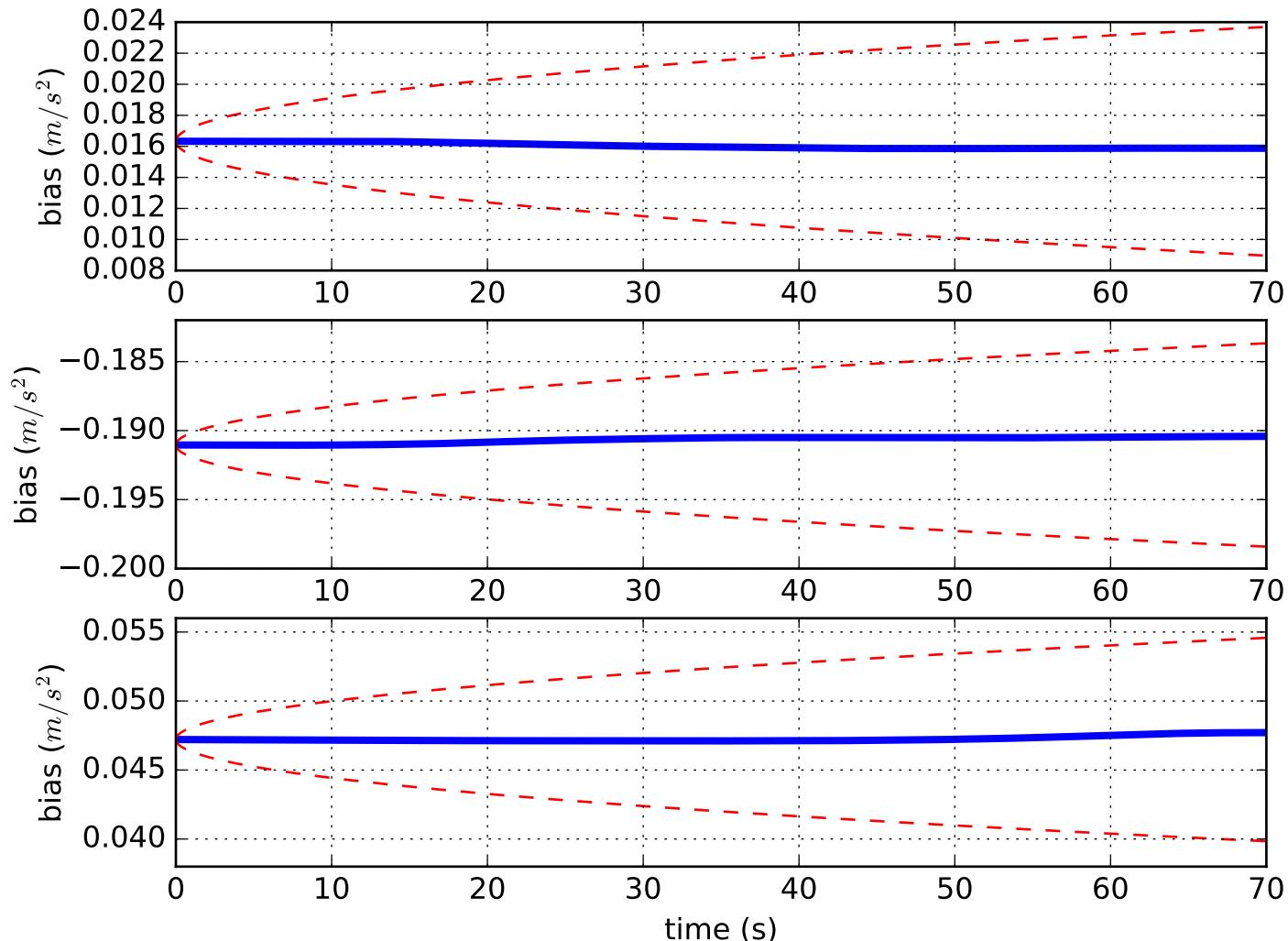
Comparison of predicted and measured specific force (imu0 frame)



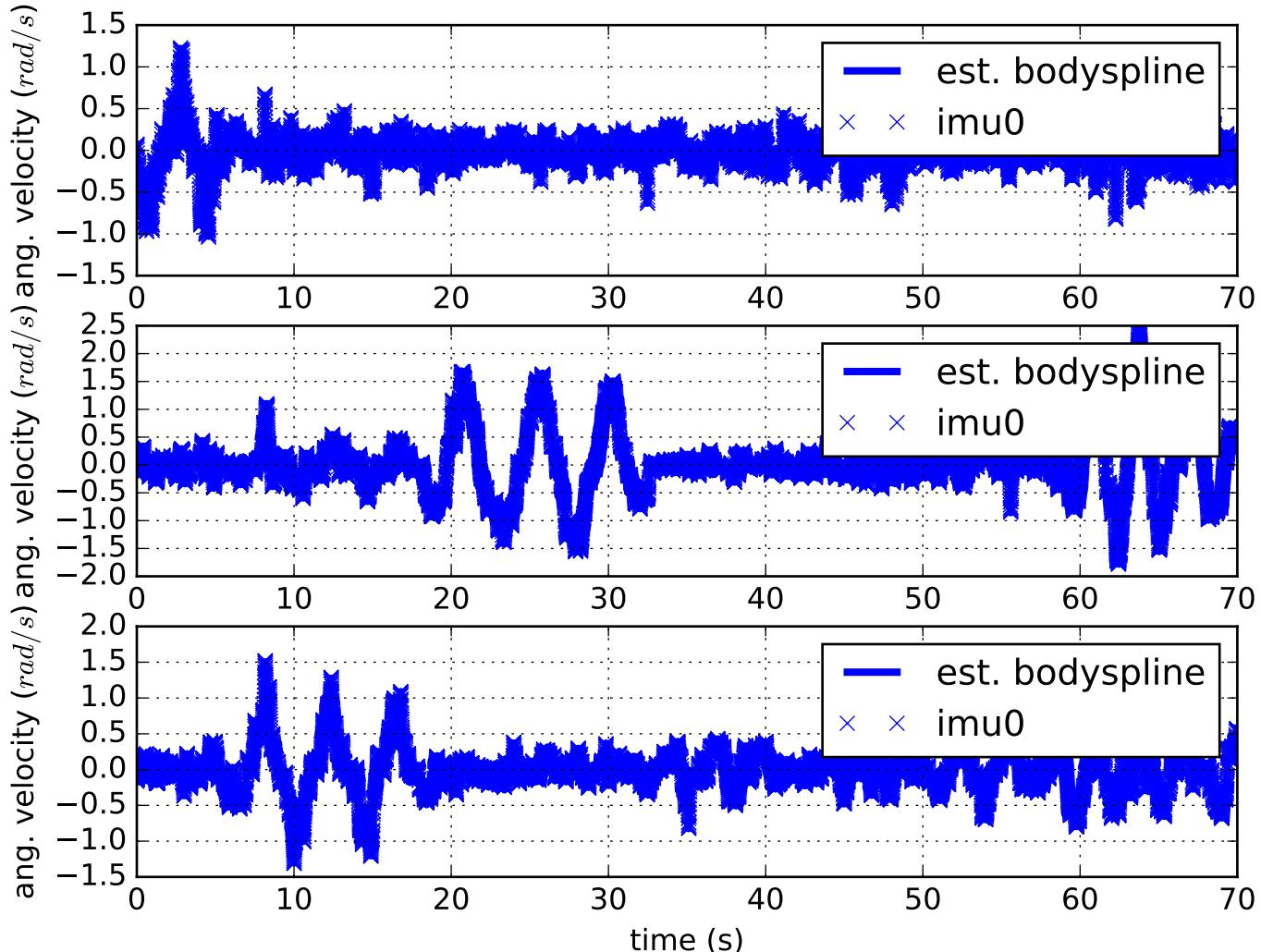
imu0: acceleration error



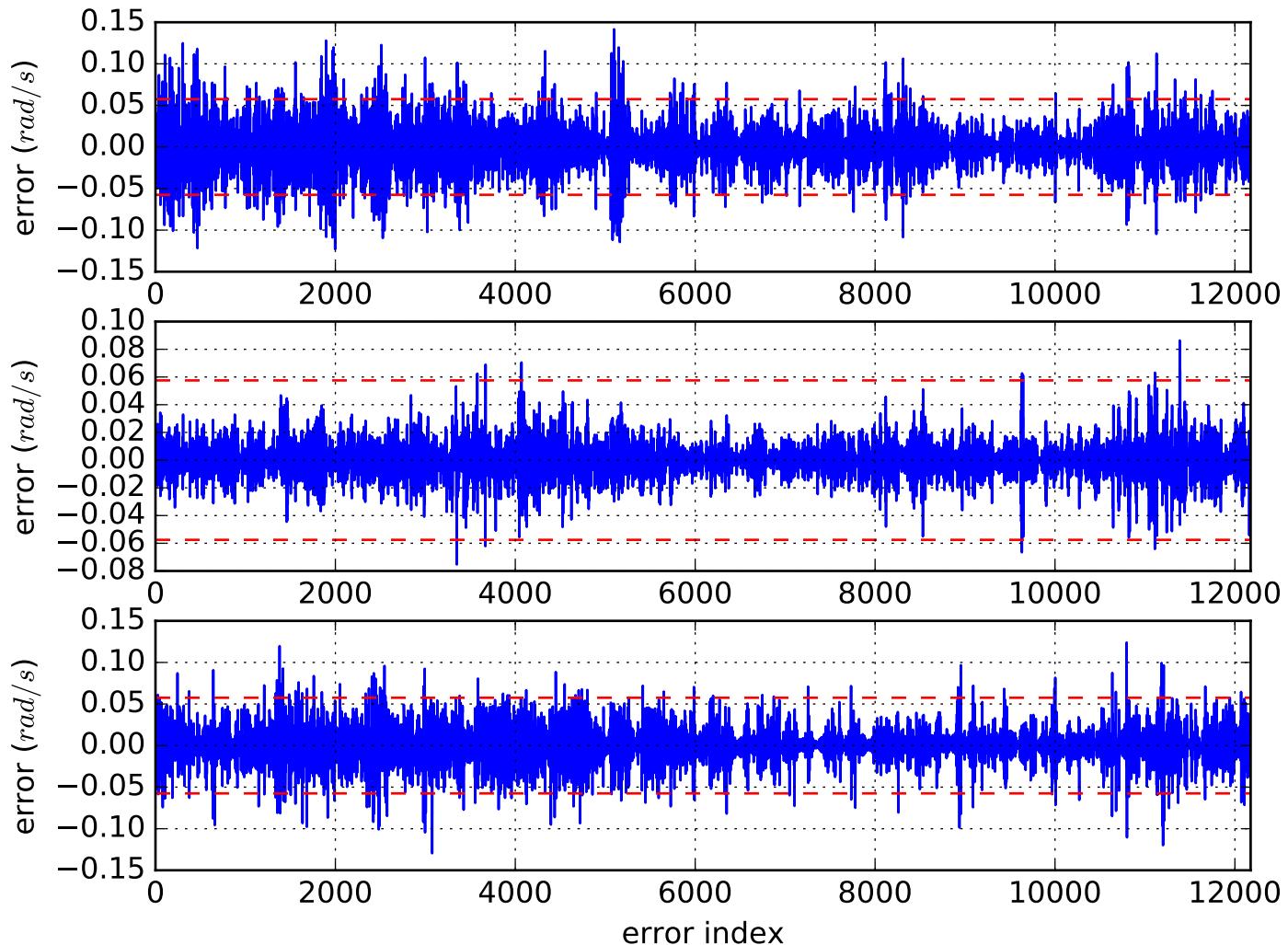
imu0: estimated accelerometer bias (imu frame)



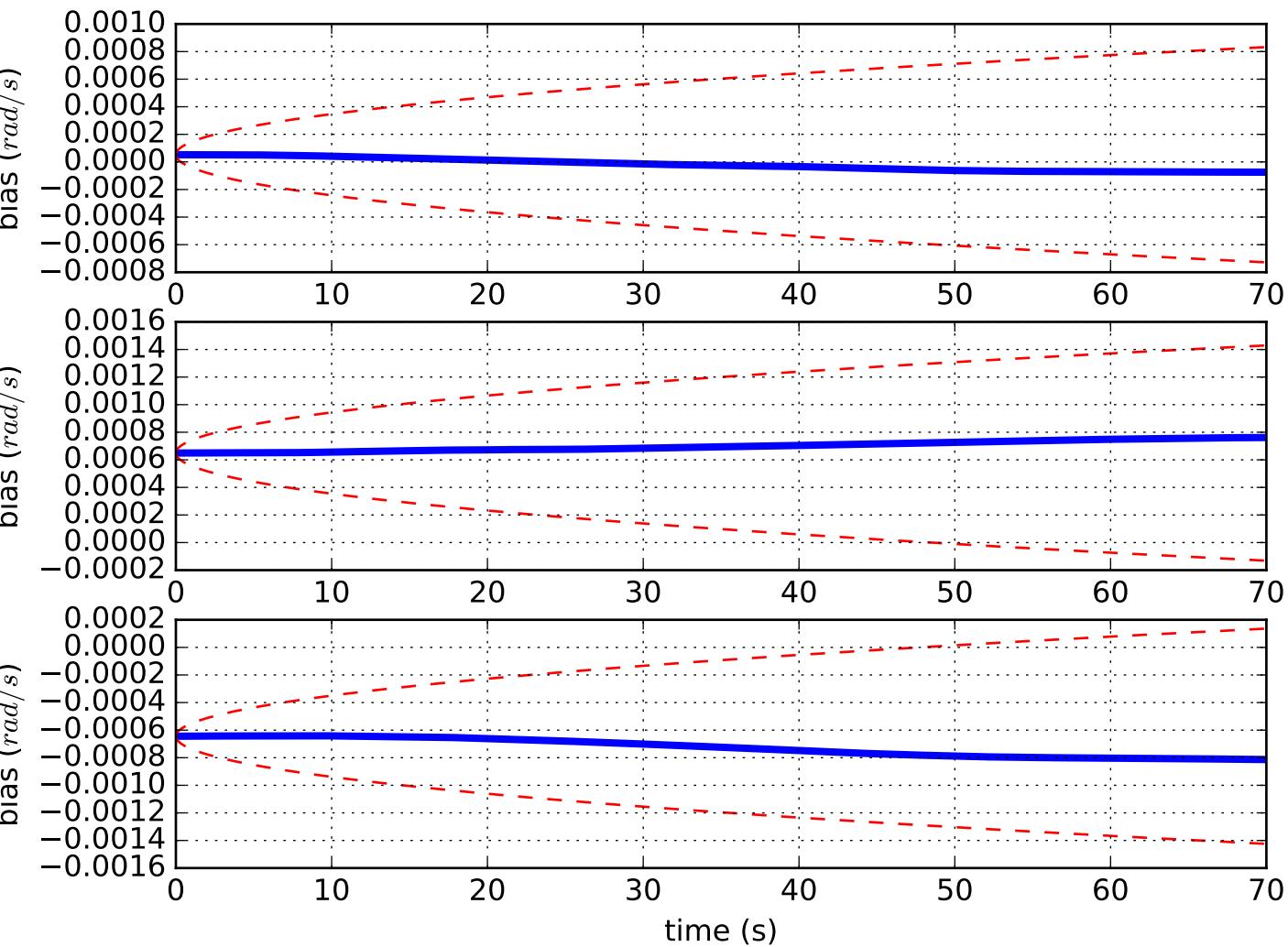
Comparison of predicted and measured angular velocities (body frame)



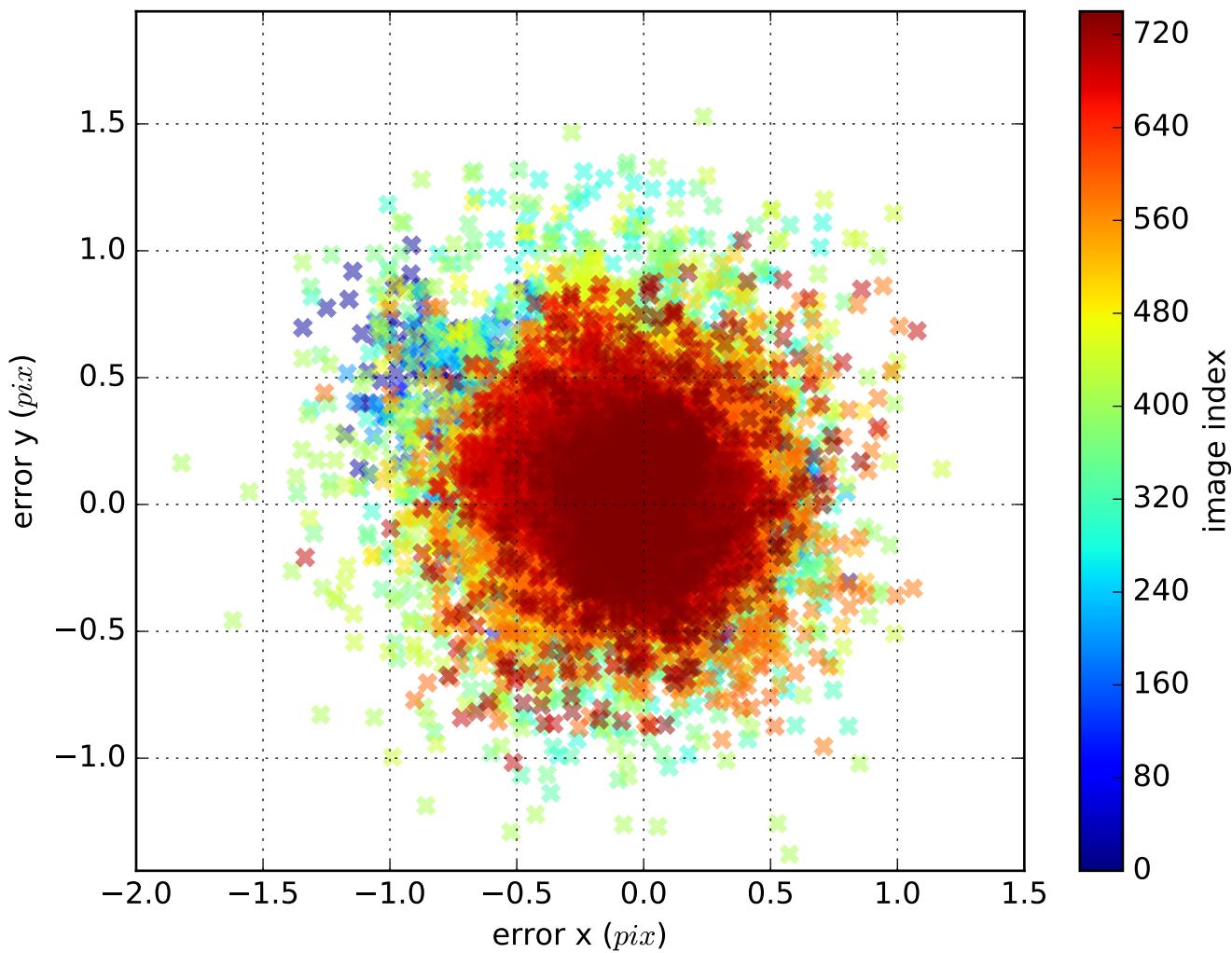
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

