

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 0.372966707403, median 0.314664764324, std: 0.255909092705
Reprojection error (cam1): mean 0.392630049649, median 0.333048532683, std: 0.265123622029
Gyroscope error (imu0): mean 1.093868663, median 0.987240622982, std: 0.60492569295
Accelerometer error (imu0): mean 1.40340123617, median 1.23244770206, std: 0.9018385259

Residuals

Reprojection error (cam0) [px]: mean 0.372966707403, median 0.314664764324, std: 0.255909092705
Reprojection error (cam1) [px]: mean 0.392630049649, median 0.333048532683, std: 0.265123622029
Gyroscope error (imu0) [rad/s]: mean 0.00262488834327, median 0.00236901969214, std: 0.00145160242146
Accelerometer error (imu0) [m/s^2]: mean 0.0396941812329, median 0.0348588851034, std: 0.025507845488

Transformation (cam0):

T_ci: (imu0 to cam0):

```
[[ 0.0148566  0.99970465 -0.01923267  0.06876678]
 [-0.99988828  0.01488549  0.00135995 -0.01596422]
 [ 0.00164584  0.01921032  0.99981411 -0.0056795 ]
 [ 0.         0.         0.         1.        ]]
```

T_ic: (cam0 to imu0):

```
[[ 0.0148566 -0.99988828  0.00164584 -0.01697472]
 [ 0.99970465  0.01488549  0.01921032 -0.06839973]
 [-0.01923267  0.00135995  0.99981411  0.00702273]
 [ 0.         0.         0.         1.        ]]
```

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

0.0

Transformation (cam1):

T_ci: (imu0 to cam1):

```
[[ 0.01266999  0.9997086 -0.02054725 -0.04134428]
 [-0.99979457  0.01299085  0.01555785 -0.01540668]
 [ 0.01582024  0.02034591  0.99966783 -0.00594157]
```

[0. 0. 0. 1.]]

T_ic: (cam1 to imu0):

[[0.01266999 -0.99979457 0.01582024 -0.01478568]
[0.9997086 0.01299085 0.02034591 0.04165327]
[-0.02054725 0.01555785 0.99966783 0.00532978]
[0. 0. 0. 1.]]

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

Baselines:

Baseline (cam0 to cam1):

[[0.99999675 0.00218463 -0.00131786 -0.11008344]
[-0.00216576 0.99989741 0.01415901 0.00078525]
[0.00134865 -0.01415611 0.99989889 -0.00058138]
[0. 0. 0. 1.]]

baseline norm: 0.110087778391 [m]

Gravity vector in target coords: [m/s^2]
[-0.01121787 -9.55718882 -2.1973709]

Calibration configuration

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cam0

Camera model: pinhole

Focal length: [459.91263682090306, 458.6496319081618]

Principal point: [365.5432331213471, 249.034619988342]

Distortion model: equidistant

Distortion coefficients: [-0.005478259877443753, 0.03883587857103405, -0.05662557766861558, 0.028733009621664984]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.088 [m]

Spacing 0.0264 [m]

cam1

Camera model: pinhole

Focal length: [458.4712715300716, 457.16126869471475]

Principal point: [379.0680087385756, 255.6513632774501]

Distortion model: equidistant

Distortion coefficients: [0.0039011169536026106, 0.006495015277749144, -0.013438513309453882, 0.010643026847869174]

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.]

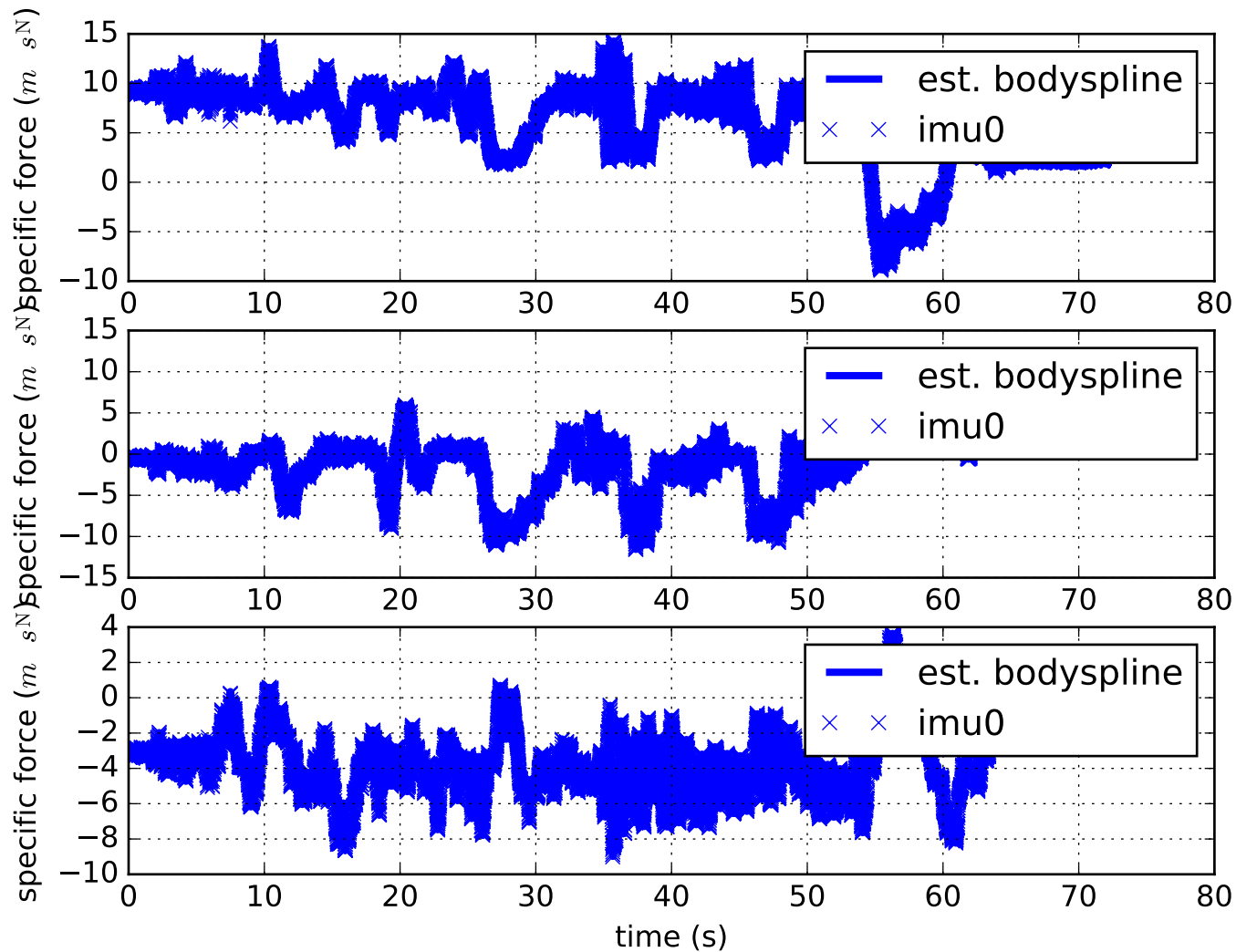
[0. 1. 0. 0.]

[0. 0. 1. 0.]

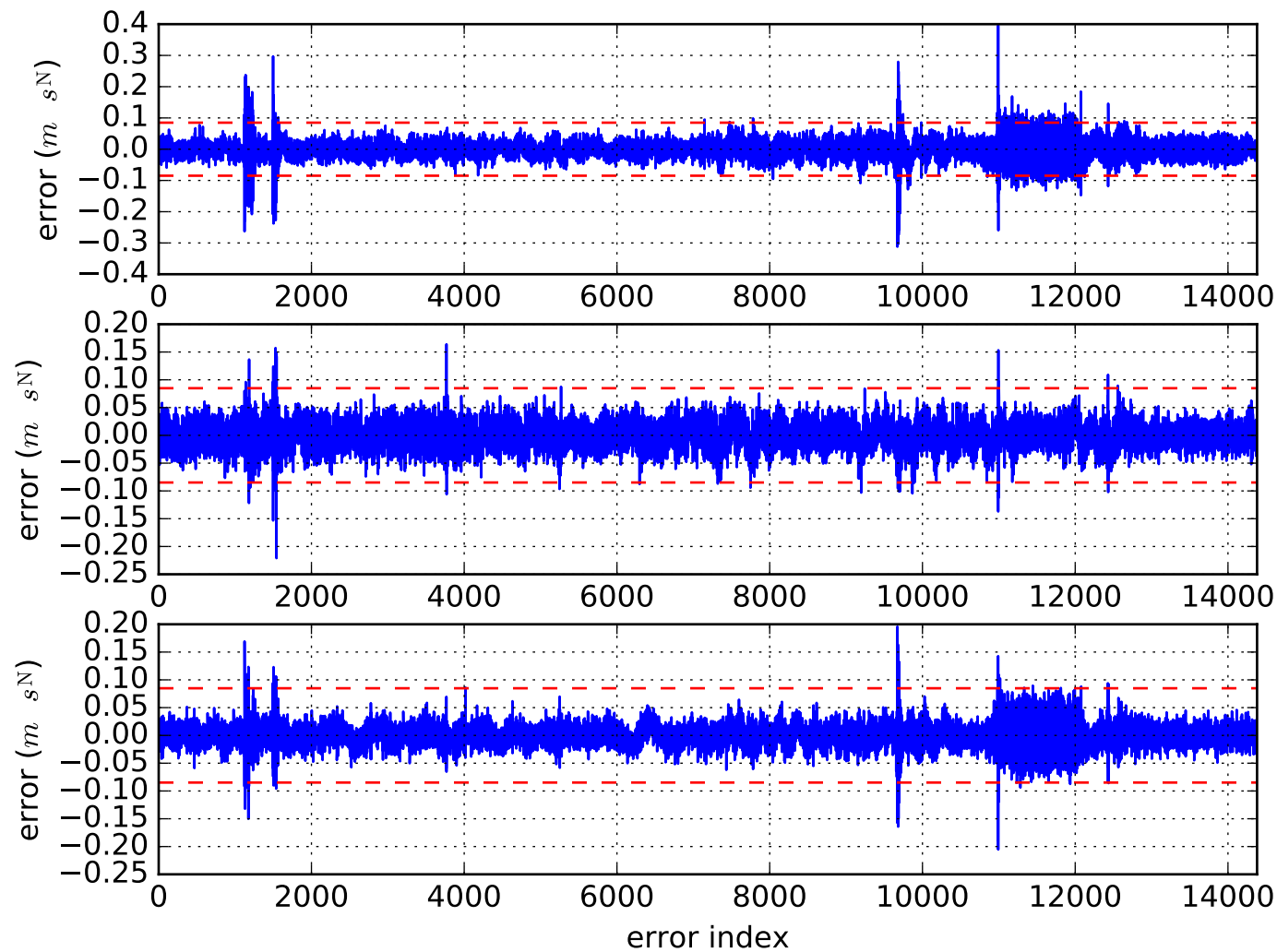
[0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

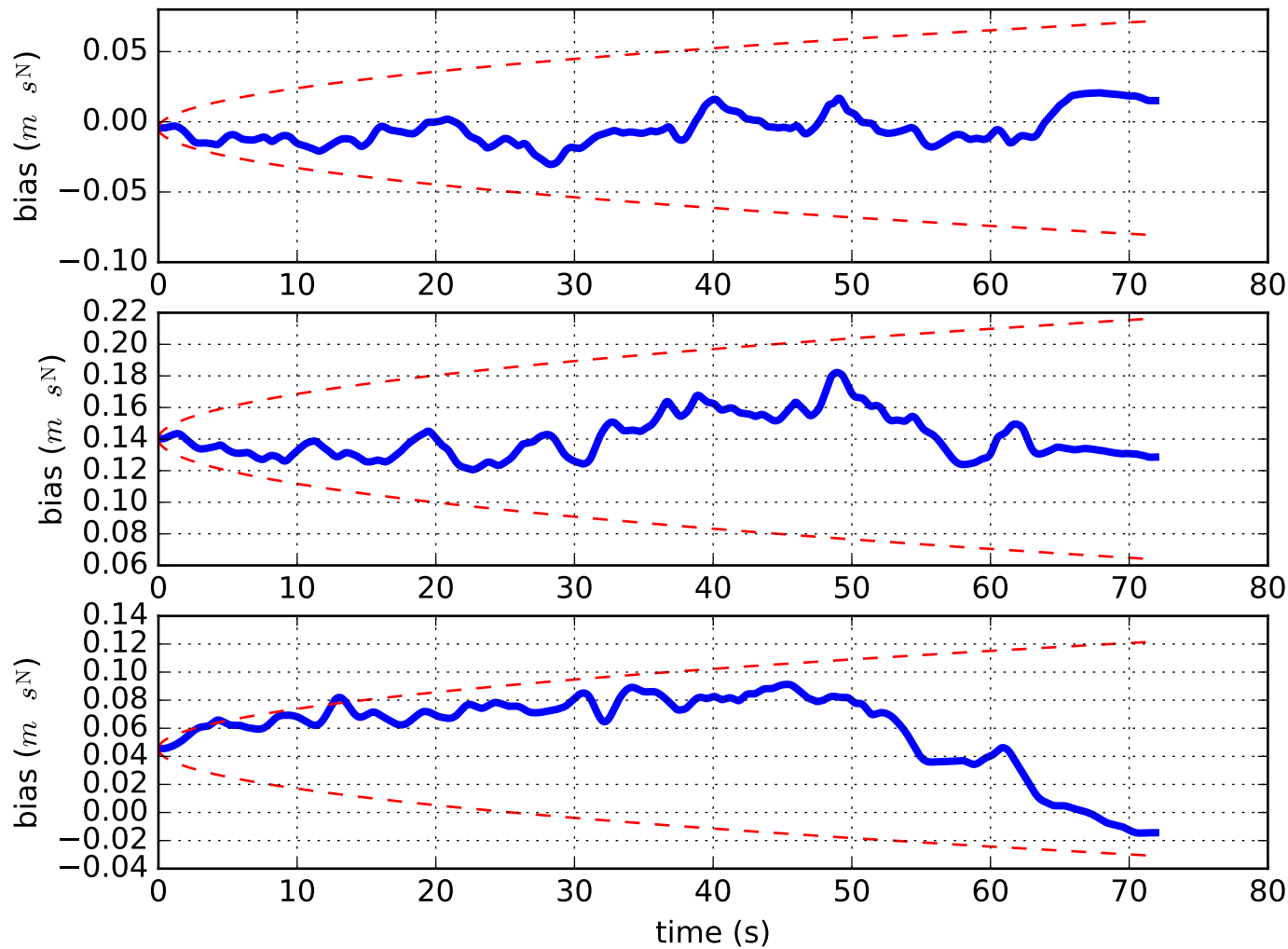
Comparison of predicted and measured specific force (imu0 frame)



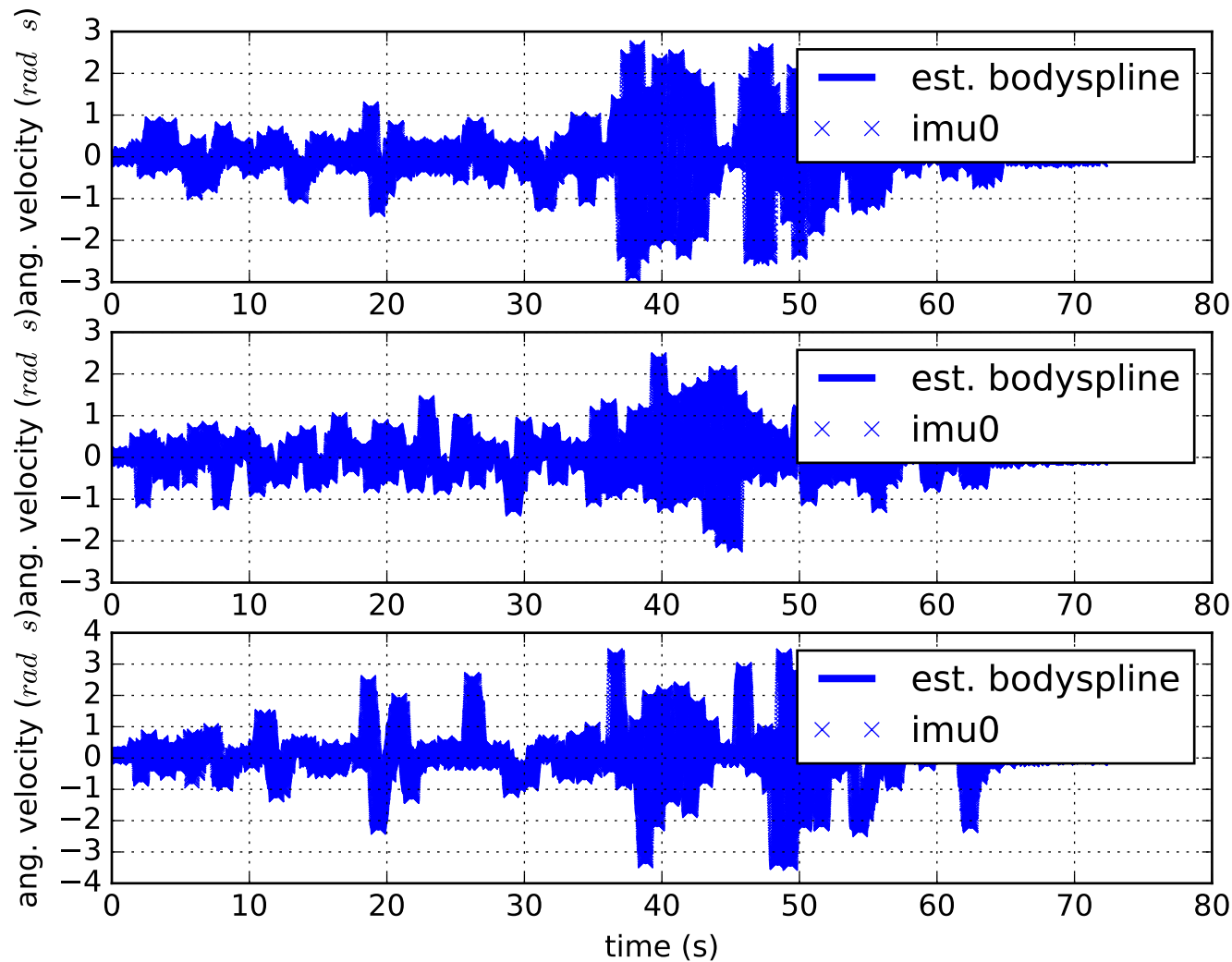
imu0: acceleration error



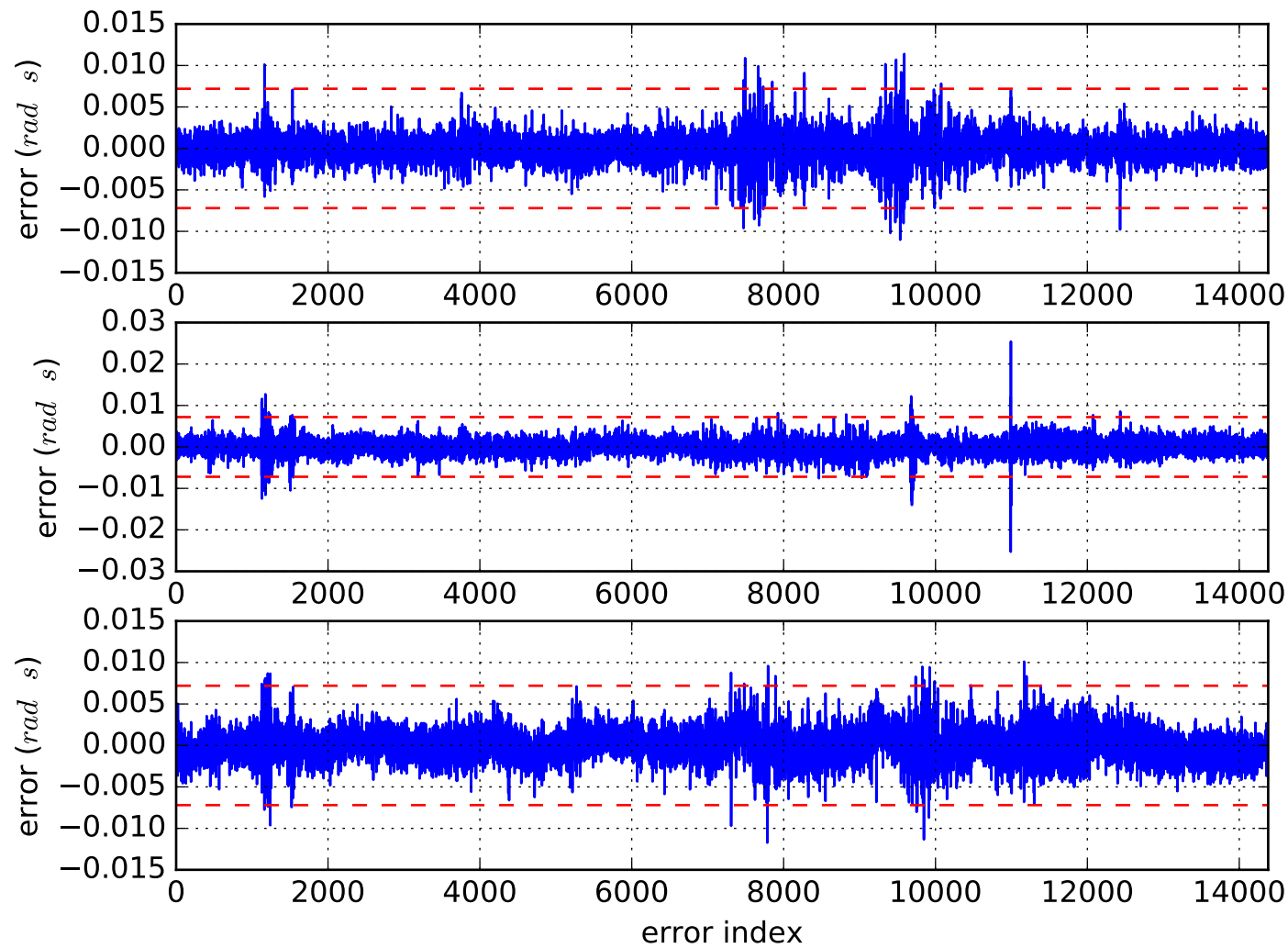
imu0: estimated accelerometer bias (imu frame)



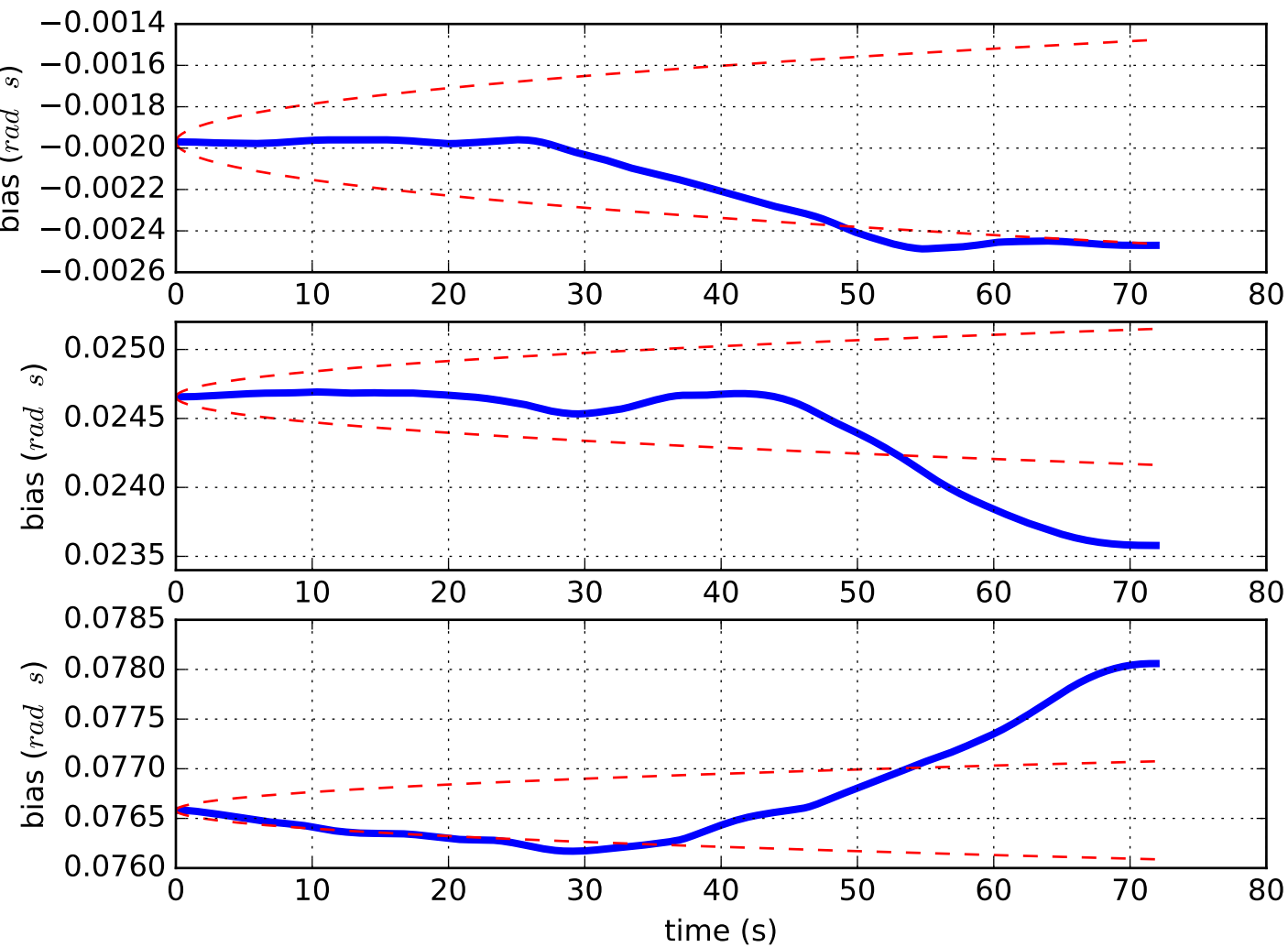
Comparison of predicted and measured angular velocities (body frame)



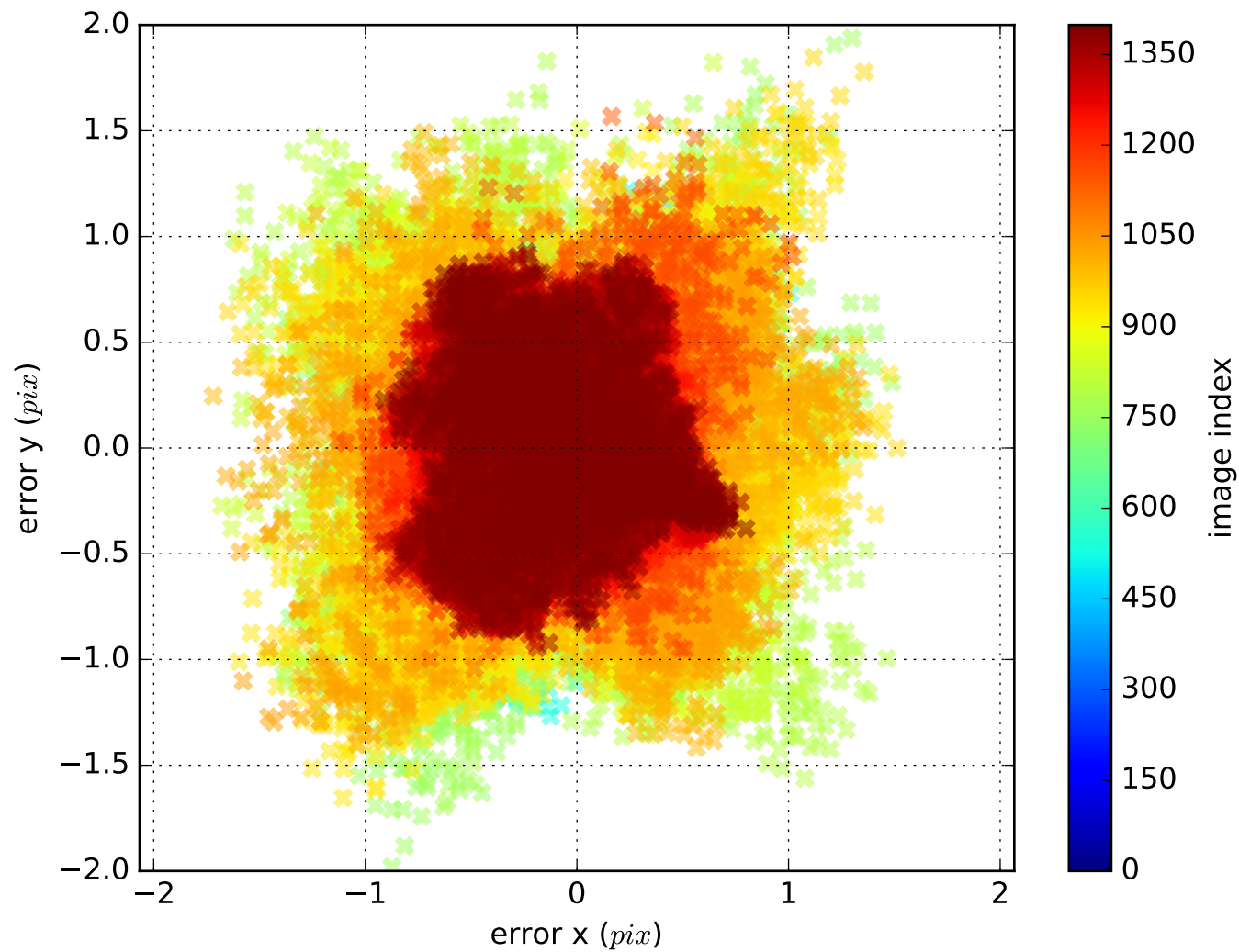
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

