

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 0.373446073424, median 0.315161446826, std: 0.256015192292
Reprojection error (cam1): mean 0.391421981019, median 0.33194105278, std: 0.26480886545
Gyroscope error (imu0): mean 1.09410194256, median 0.986696481905, std: 0.604921533149
Accelerometer error (imu0): mean 1.40298595327, median 1.23161923729, std: 0.901802077447

Residuals

Reprojection error (cam0) [px]: mean 0.373446073424, median 0.315161446826, std: 0.256015192292
Reprojection error (cam1) [px]: mean 0.391421981019, median 0.33194105278, std: 0.26480886545
Gyroscope error (imu0) [rad/s]: mean 0.00262544812966, median 0.00236771395077, std: 0.00145159243944
Accelerometer error (imu0) [m/s^2]: mean 0.0396824352587, median 0.0348354525812, std: 0.02550681457

Transformation (cam0):

T_ci: (imu0 to cam0):
[[0.01491747 0.99971402 -0.01869073 0.06893535]
 [-0.99988538 0.01496316 0.00230715 -0.01555116]
 [0.00258617 0.01865417 0.99982265 -0.00609405]
 [0. 0. 0. 1.]]

T_ic: (cam0 to imu0):
[[0.01491747 -0.99988538 0.00258617 -0.01656196]
 [0.99971402 0.01496316 0.01865417 -0.06856926]
 [-0.01869073 0.00230715 0.99982265 0.0074173]
 [0. 0. 0. 1.]]

timeshift cam0 to imu0: [s] (t_imu = t_cam + shift)
0.0

Transformation (cam1):

T_ci: (imu0 to cam1):
[[0.01265171 0.99971485 -0.02025239 -0.04125514]
 [-0.99977994 0.01298628 0.01647489 -0.01506425]
 [0.01673319 0.0200395 0.99965915 -0.00609638]

[0. 0. 0. 1.]]

T_ic: (cam1 to imu0):

[[0.01265171 -0.99977994 0.01673319 -0.01443697]
[0.99971485 0.01298628 0.0200395 0.04156117]
[-0.02025239 0.01647489 0.99965915 0.00550697]
[0. 0. 0. 1.]]

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

Baselines:

Baseline (cam0 to cam1):

[[0.99999621 0.00226191 -0.00156723 -0.1101646]
[-0.00223955 0.99989768 0.01412862 0.00072581]
[0.00159902 -0.01412505 0.99989896 -0.00033284]
[0. 0. 0. 1.]]

baseline norm: 0.110167494304 [m]

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

[-0.01181145 -9.55697619 -2.19829243]

Calibration configuration

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cam0

Camera model: ds

Focal length: [356.9931554422073, 356.0173134823302]

Principal point: [365.22589334242343, 248.4240035022962]

DS xi: -0.223014520142

DS alpha: 0.572122416624

Distortion model: none

Distortion coefficients: []

Type: aprilgrid

Tags:

Rows: 6

Cols: 6
Size: 0.088 [m]
Spacing 0.0264 [m]

cam1

Camera model: ds
Focal length: [360.0021793312309, 359.0027816010089]
Principal point: [378.89145062804295, 255.0867532256354]
DS xi: -0.214618630903
DS alpha: 0.574673985973
Distortion model: none
Distortion coefficients: []
Type: aprilgrid
Tags:
 Rows: 6
 Cols: 6
 Size: 0.088 [m]
 Spacing 0.0264 [m]

IMU configuration

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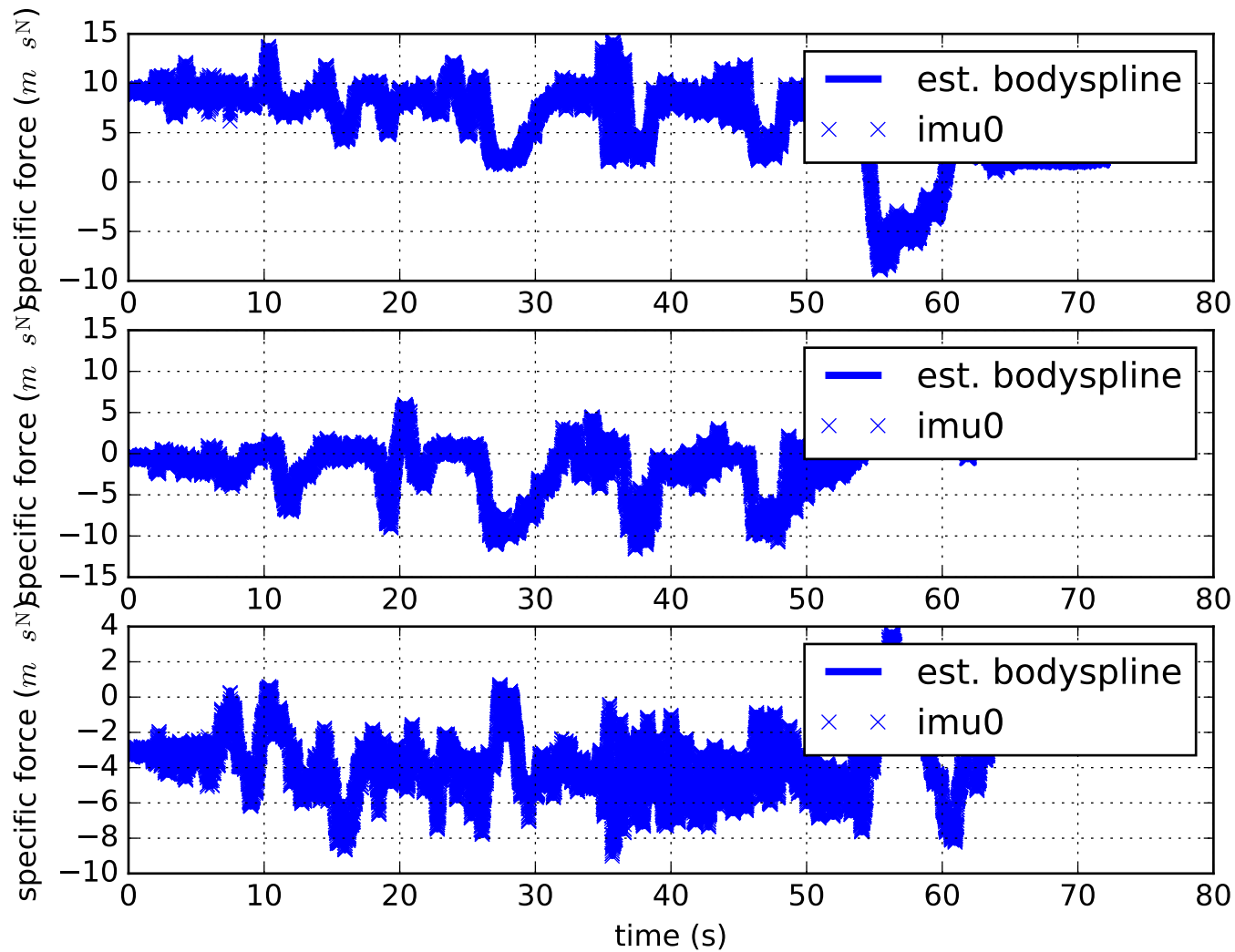
IMU0:

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.]

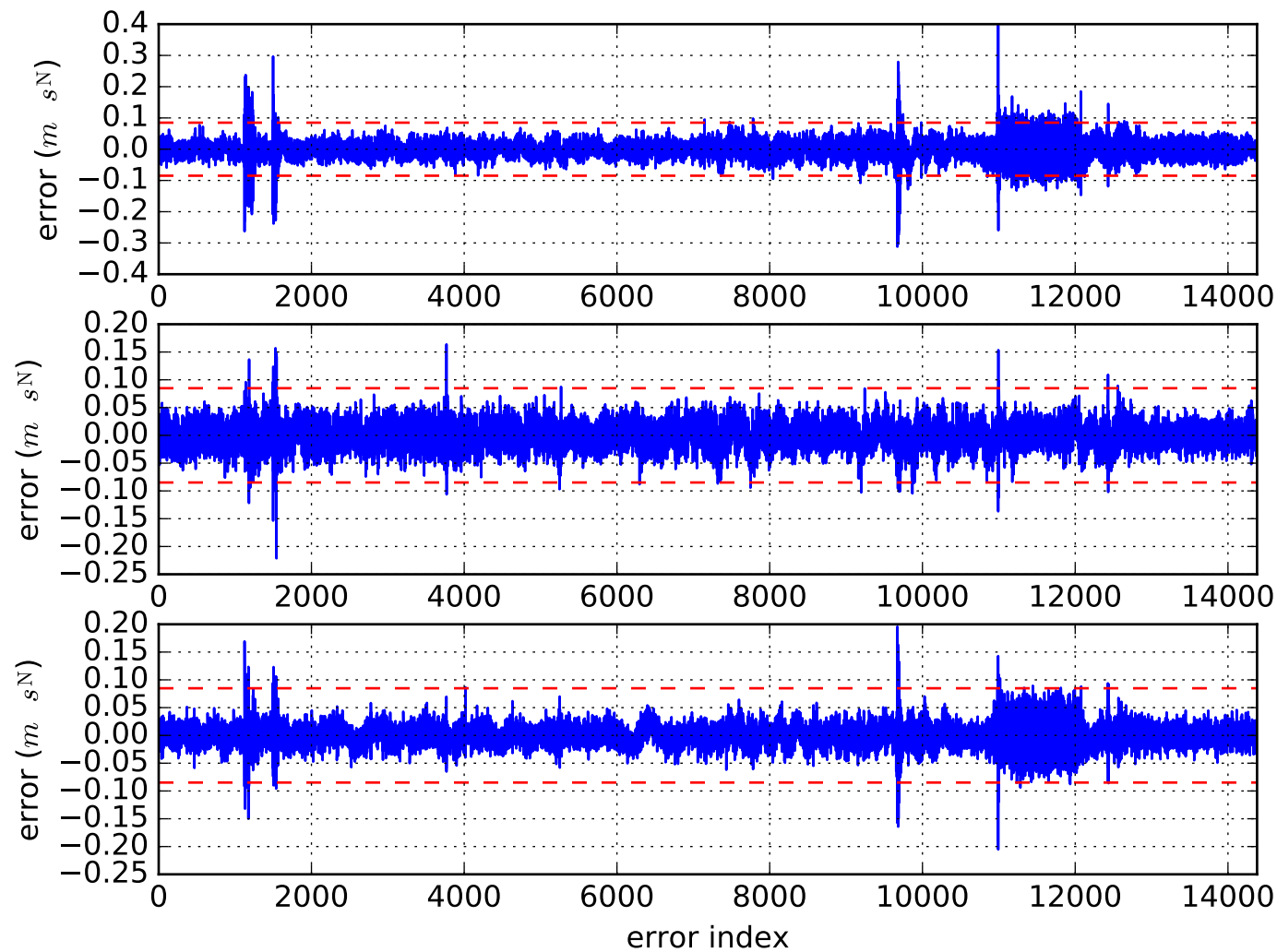
```
[ 0.  1.  0.  0.]  
[ 0.  0.  1.  0.]  
[ 0.  0.  0.  1.]
```

time offset with respect to IMU0: 0.0 [s]

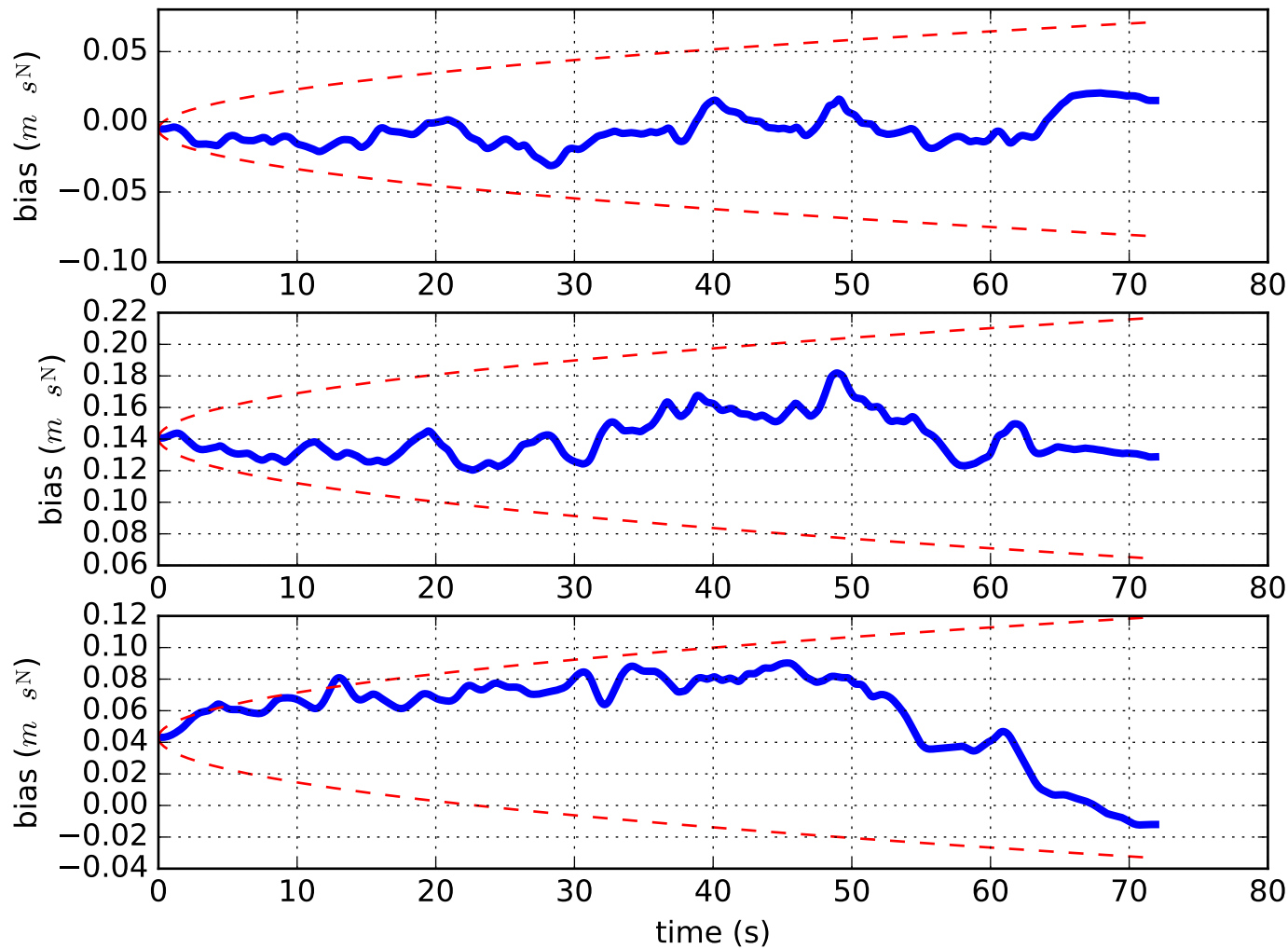
Comparison of predicted and measured specific force (imu0 frame)



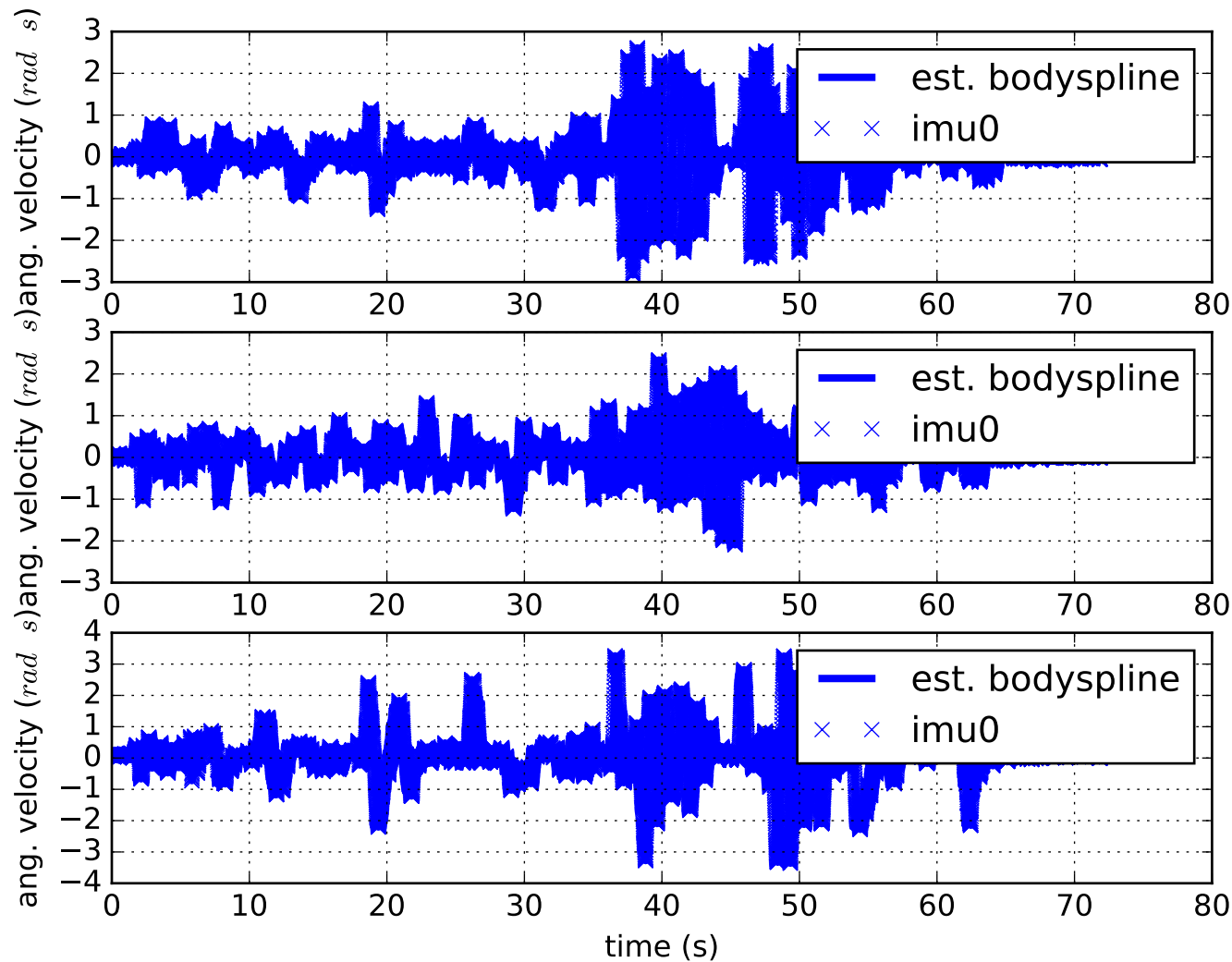
imu0: acceleration error



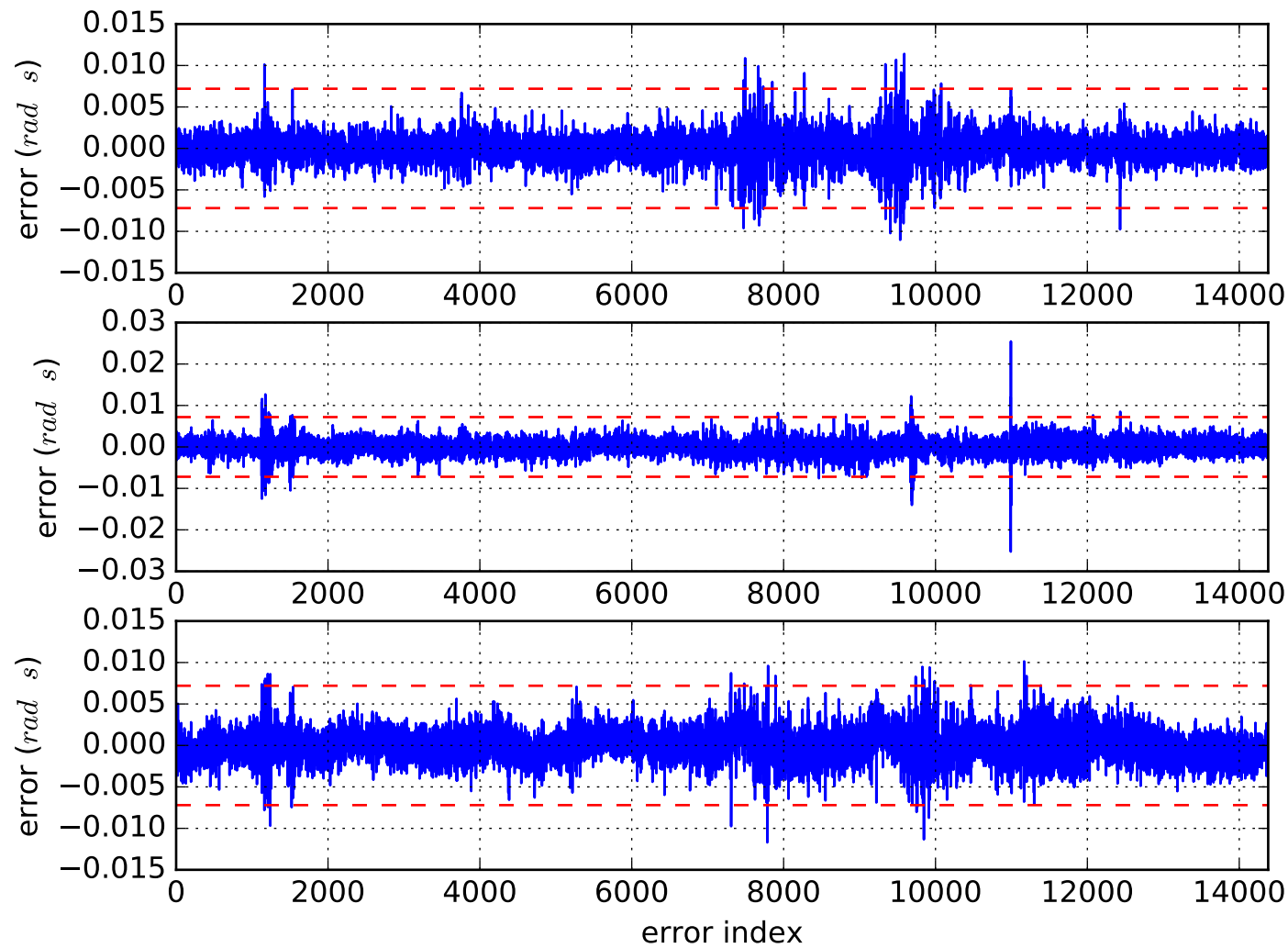
imu0: estimated accelerometer bias (imu frame)



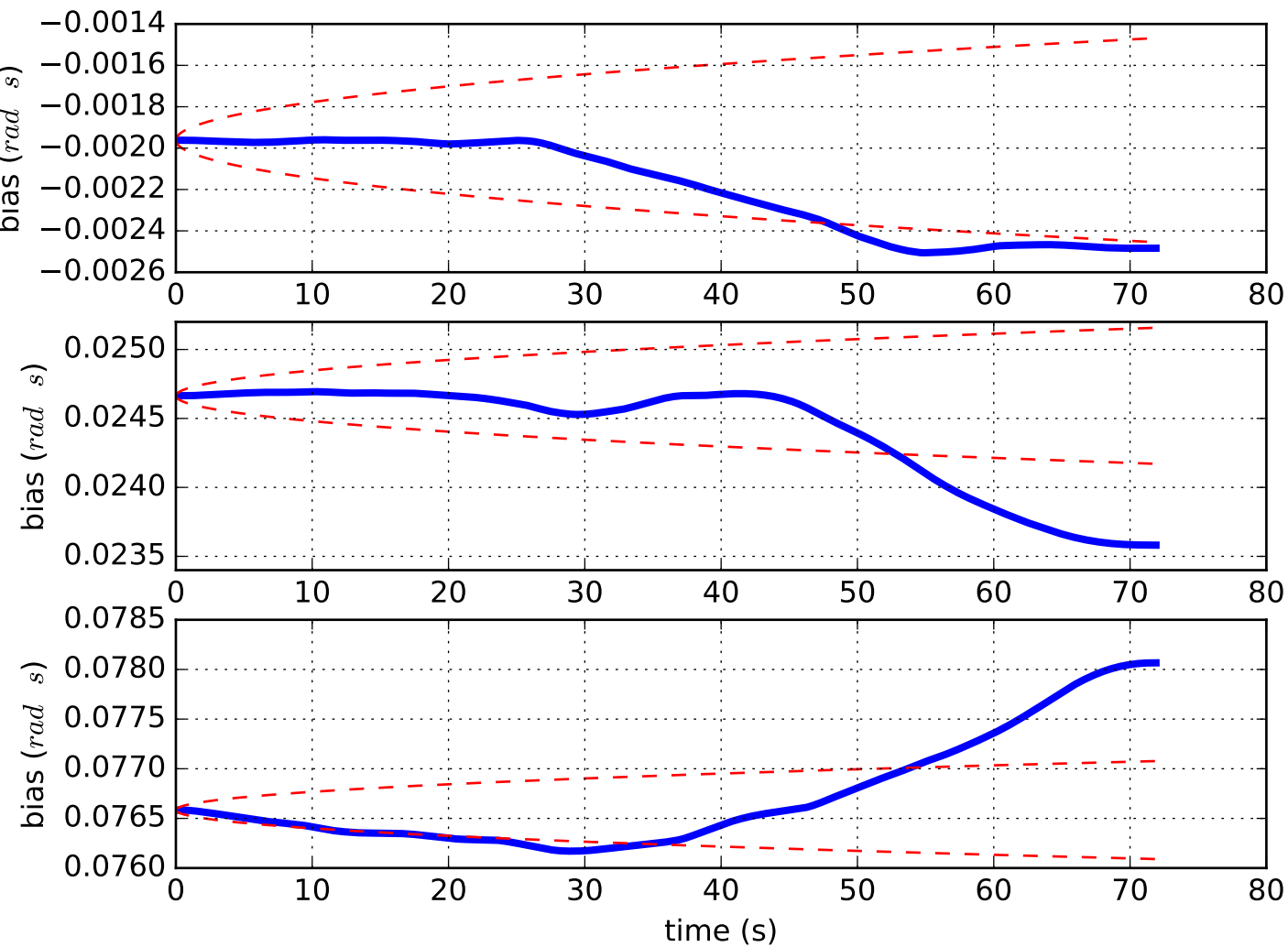
Comparison of predicted and measured angular velocities (body frame)



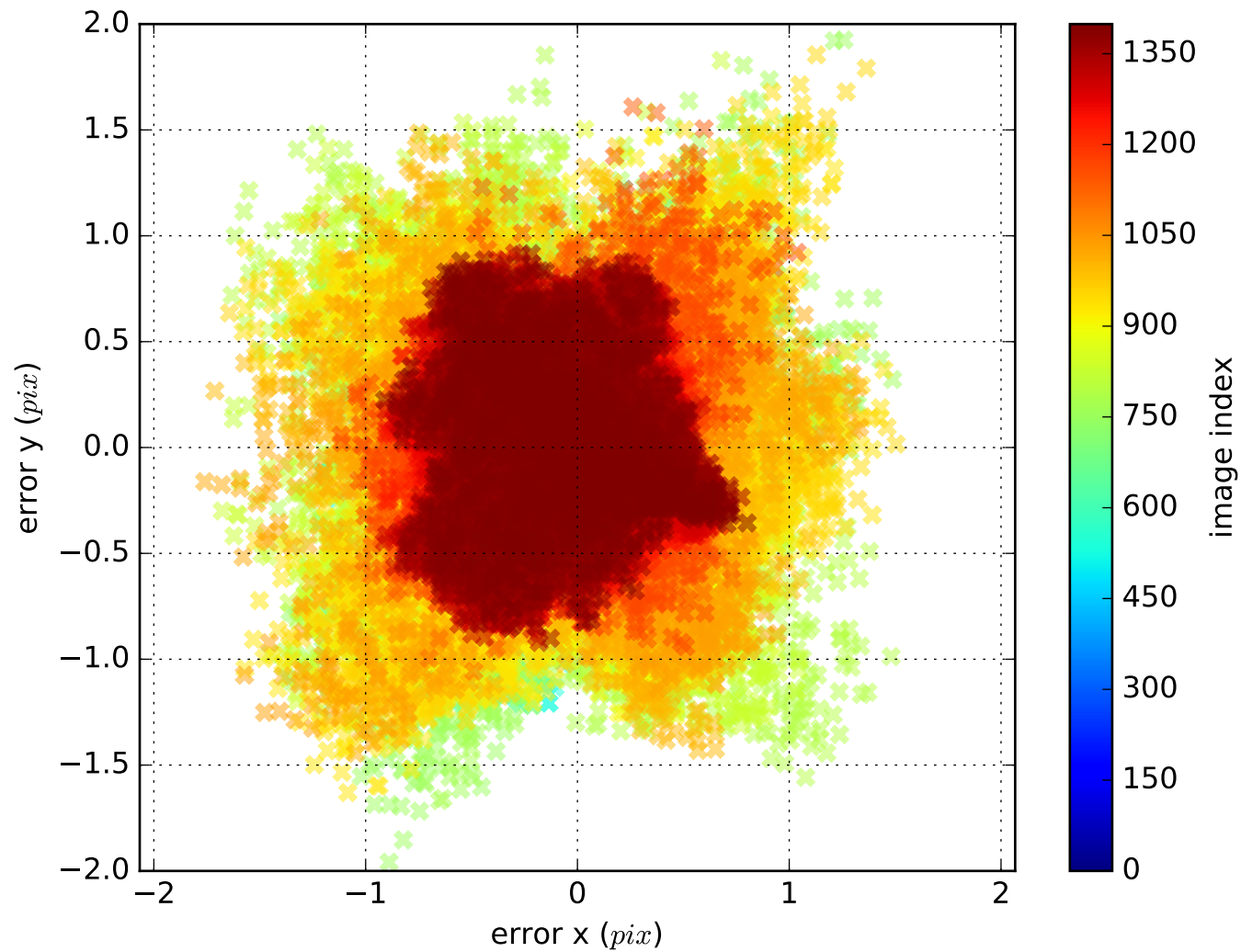
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

