

Calibration results

=====

Normalized Residuals

Reprojection error (cam0): mean 0.0876611512998, median 0.0832029375752, std: 0.0441347774946
Reprojection error (cam1): mean 0.0853554663489, median 0.0816411514782, std: 0.0421630885017
Gyroscope error (imu0): mean 0.49222654522, median 0.457170612662, std: 0.260762377701
Accelerometer error (imu0): mean 0.583574848128, median 0.537967634183, std: 0.30179785273

Residuals

Reprojection error (cam0) [px]: mean 0.0876611512998, median 0.0832029375752, std: 0.0441347774946
Reprojection error (cam1) [px]: mean 0.0853554663489, median 0.0816411514782, std: 0.0421630885017
Gyroscope error (imu0) [rad/s]: mean 0.00111378152962, median 0.00103445900919, std: 0.000590037905762
Accelerometer error (imu0) [m/s^2]: mean 0.0231083850167, median 0.0213024314826, std: 0.0119505852599

Transformation (cam0):

T_ci: (imu0 to cam0):
[[-0.99954367 0.02900521 -0.00843495 0.04831803]
 [0.00739403 -0.03580947 -0.99933128 -0.04606021]
 [-0.02928786 -0.99893763 0.03557866 -0.06740713]
 [0. 0. 0. 1.]]

T_ic: (cam0 to imu0):
[[-0.99954367 0.00739403 -0.02928786 0.04666234]
 [0.02900521 -0.03580947 -0.99893763 -0.07038638]
 [-0.00843495 -0.99933128 0.03557866 -0.04322359]
 [0. 0. 0. 1.]]

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

0.0

Transformation (cam1):

T_ci: (imu0 to cam1):
[[-0.99953651 0.02945447 -0.00769436 -0.05257368]
 [0.00802263 0.01104305 -0.99990684 -0.04377635]
 [-0.02936676 -0.99950512 -0.01127423 -0.07054358]

[0. 0. 0. 1.]]

T_ic: (cam1 to imu0):

[[-0.99953651 0.00802263 -0.02936676 -0.05426975]
[0.02945447 0.01104305 -0.99950512 -0.06847672]
[-0.00769436 -0.99990684 -0.01127423 -0.04497212]
[0. 0. 0. 1.]]

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

Baselines:

Baseline (cam0 to cam1):

[[0.99999962 -0.00075614 -0.00042265 -0.10095501]
[0.00073551 0.99890206 -0.04684163 -0.00095971]
[0.00045761 0.0468413 0.99890224 -0.00107504]
[0. 0. 0. 1.]]

baseline norm: 0.100965291285 [m]

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

[0.03324415 -9.69442074 -1.47835188]

Calibration configuration

=====

cam0

Camera model: omni

Focal length: [607.4560945764572, 607.3730037388721]

Principal point: [254.57254889699146, 256.3861726655053]

Omni xi: 2.17429421161

Distortion model: radtan

Distortion coefficients: [0.09096117178470957, 0.9228142292752213, 0.001097273527437864, 0.0008199535383597025]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.088 [m]
Spacing 0.0264 [m]

cam1

Camera model: omni
Focal length: [574.3888121198453, 574.3207294391619]
Principal point: [252.16590148622856, 254.0621552038463]
Omni xi: 2.01242092291
Distortion model: radtan
Distortion coefficients: [0.03132433272184051, 0.5026987505081562, 0.0020853957199080866, 0.0008966957274826579]
Type: aprilgrid
Tags:
 Rows: 6
 Cols: 6
 Size: 0.088 [m]
 Spacing 0.0264 [m]

IMU configuration

=====

IMU0:

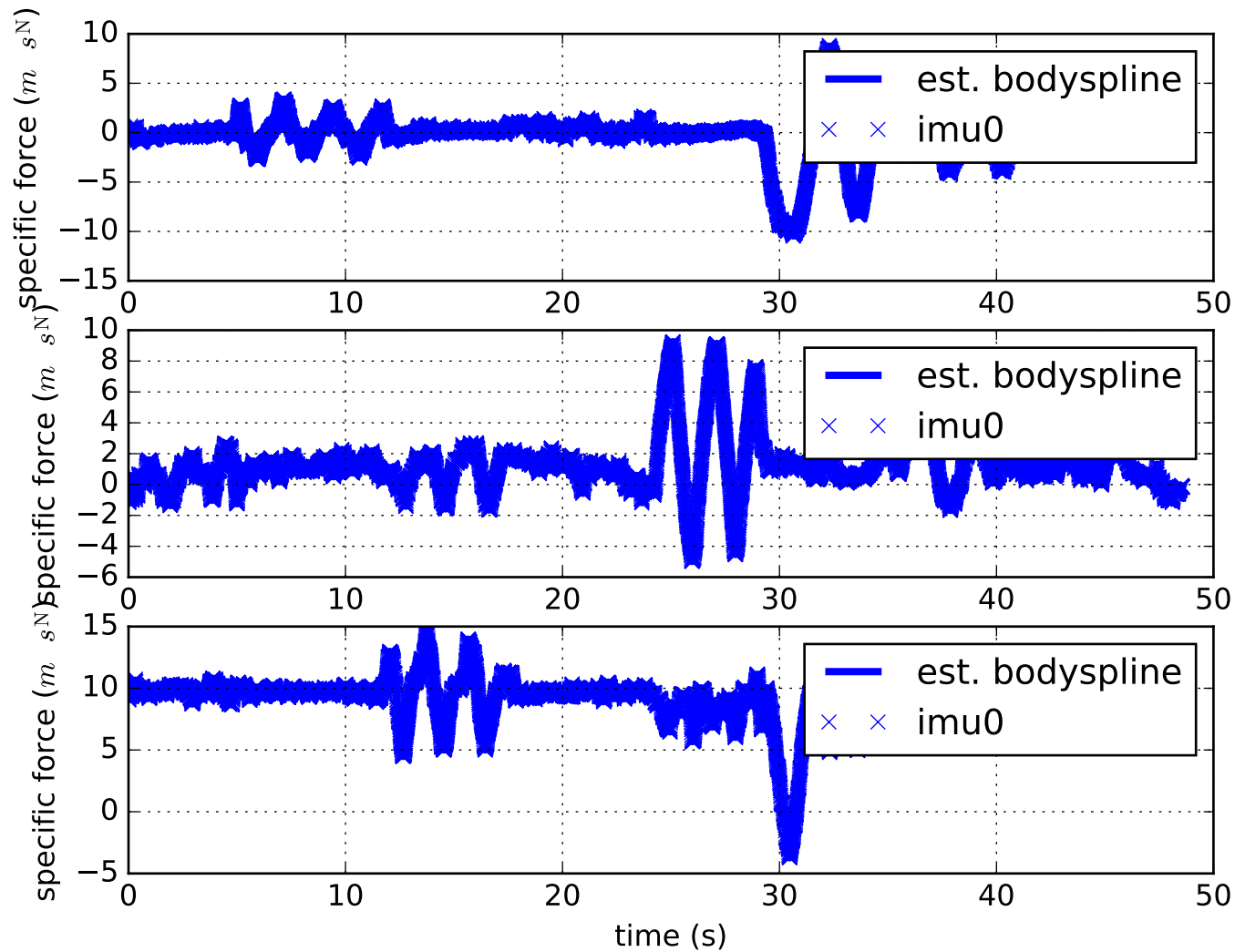
Model: calibrated
Update rate: 200.0
Accelerometer:
 Noise density: 0.0028
 Noise density (discrete): 0.0395979797464
 Random walk: 0.00086
Gyroscope:
 Noise density: 0.00016
 Noise density (discrete): 0.0022627416998
 Random walk: 2.2e-05

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

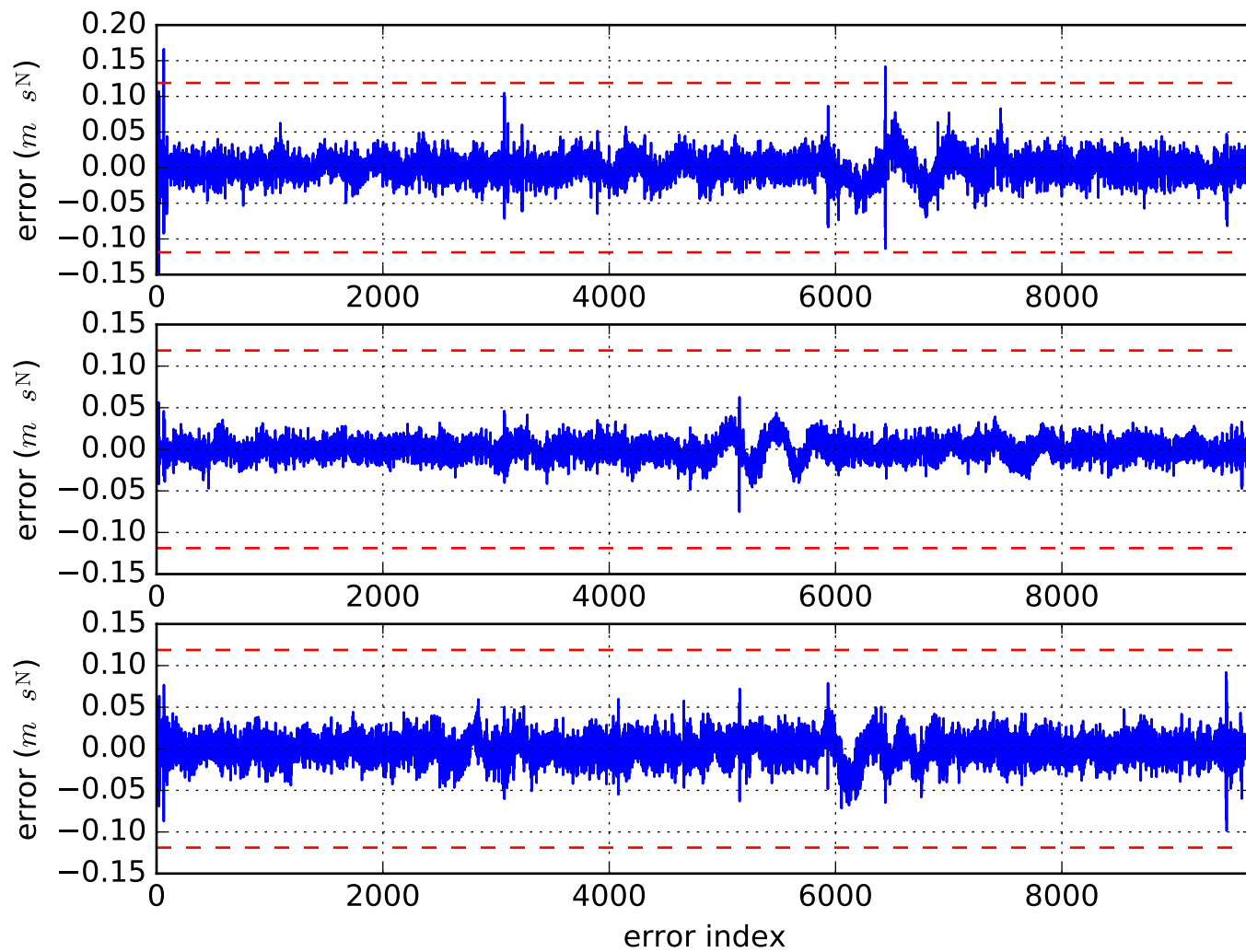
[0. 0. 0. 1.]

time offset with respect to IMU0: 0.0 [s]

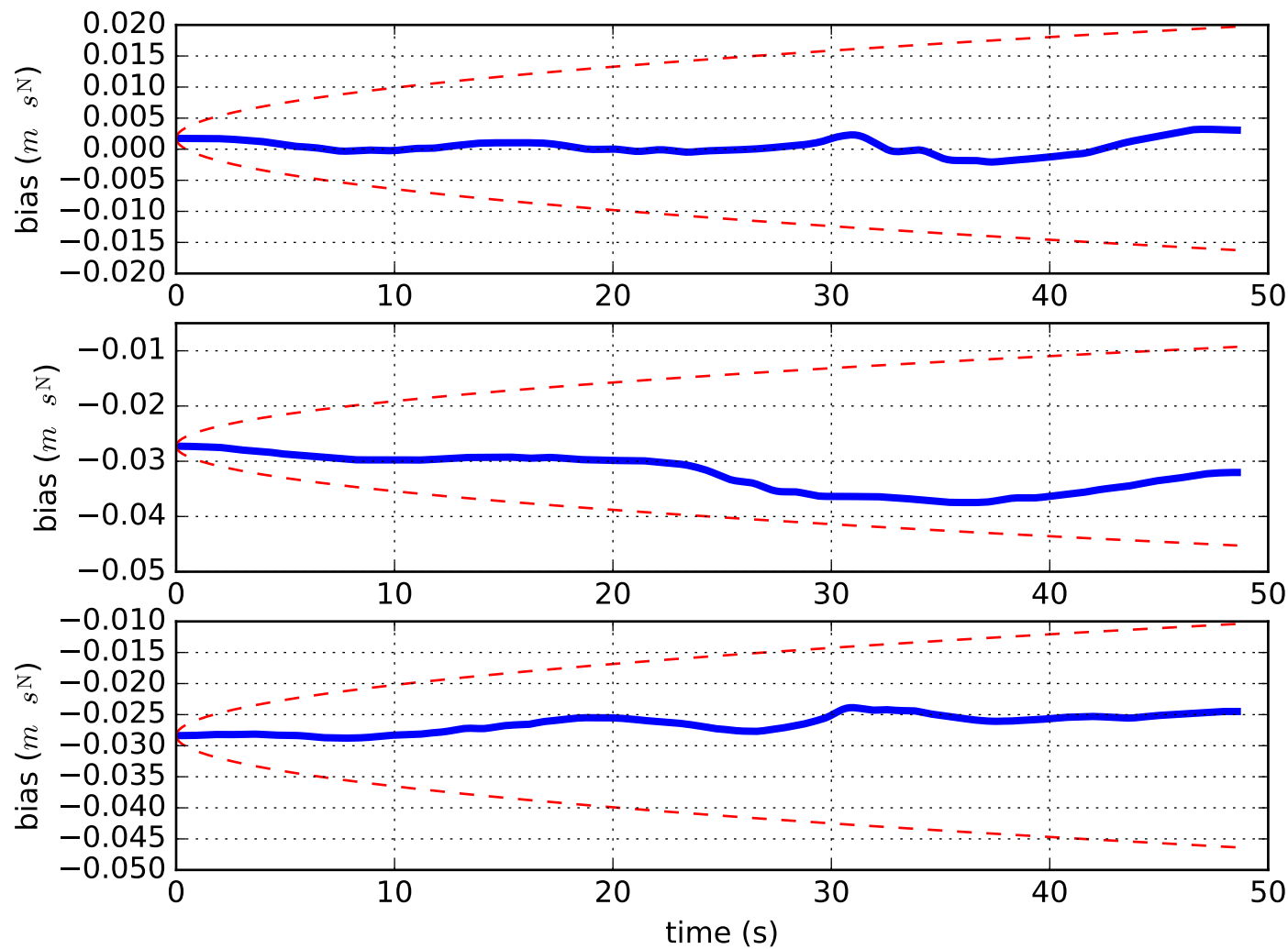
Comparison of predicted and measured specific force (imu0 frame)



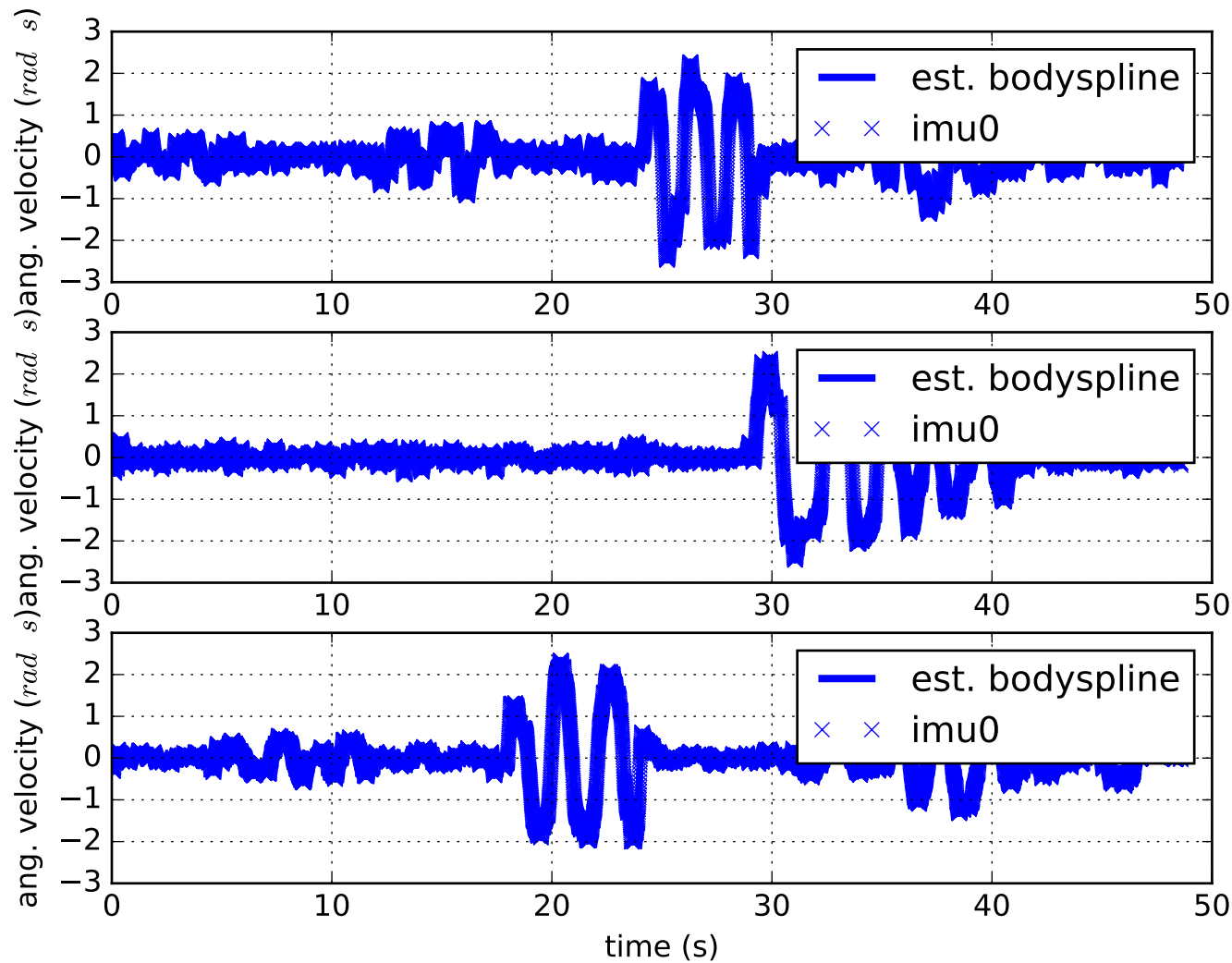
imu0: acceleration error



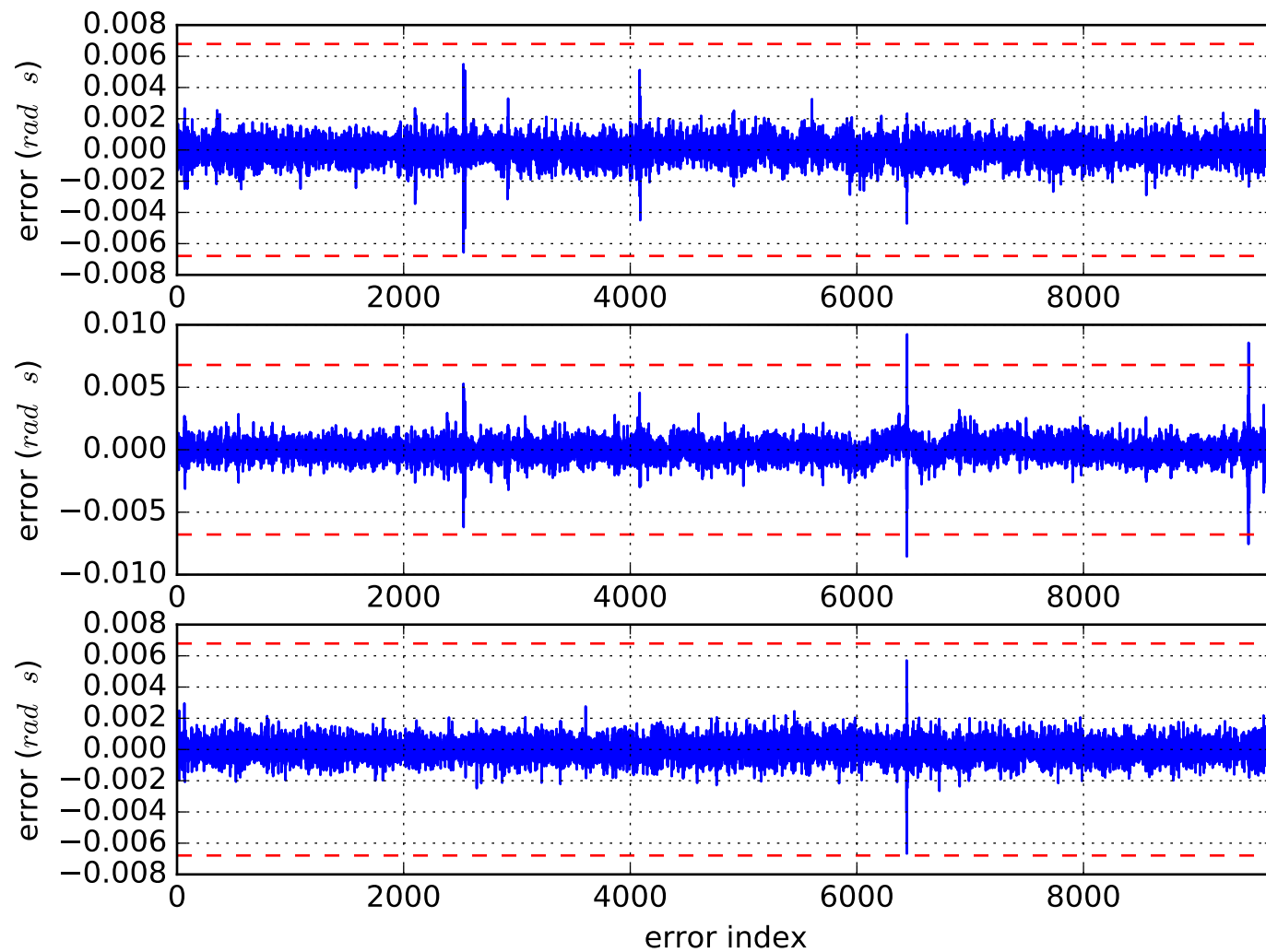
imu0: estimated accelerometer bias (imu frame)



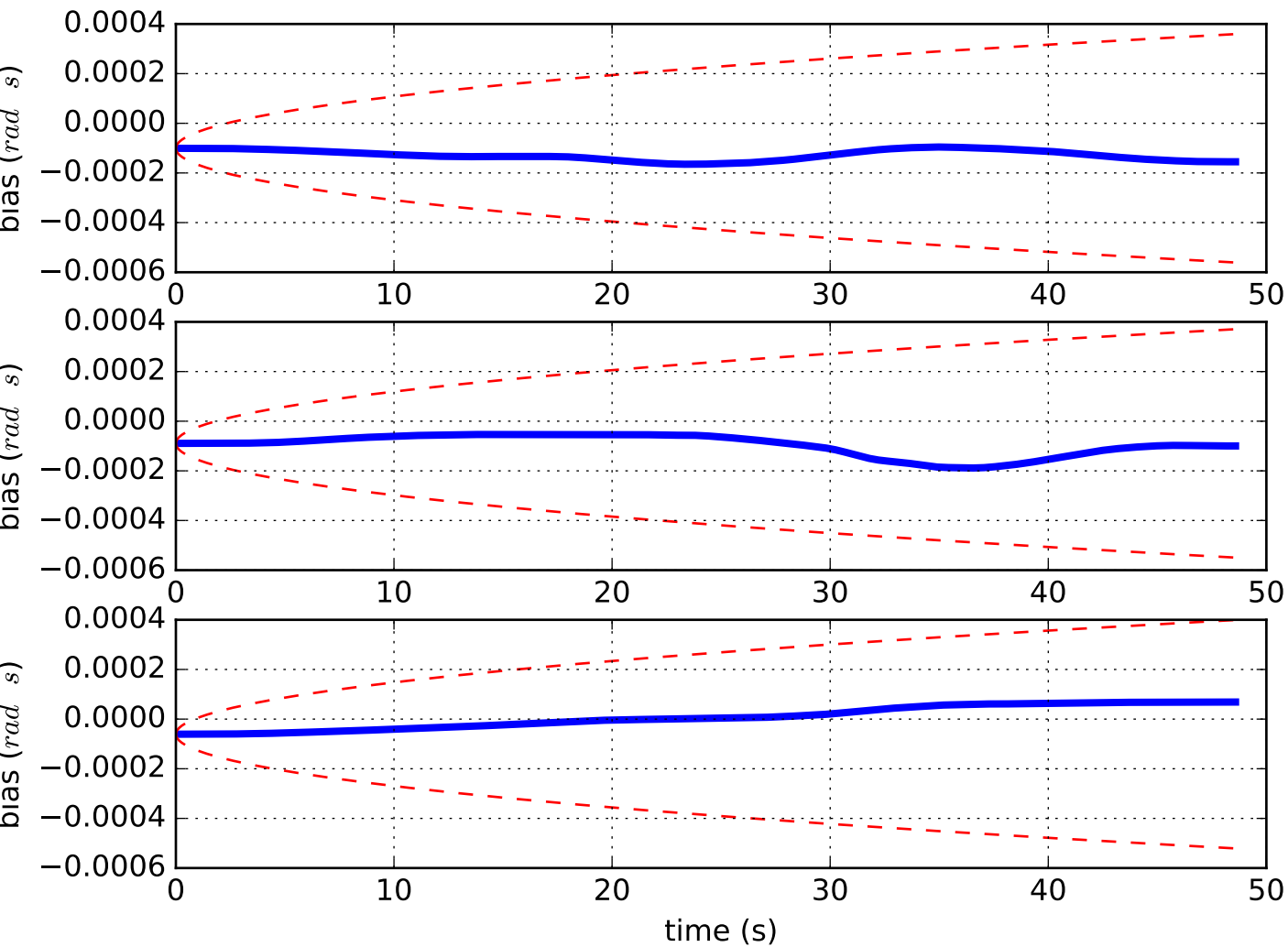
Comparison of predicted and measured angular velocities (body frame)



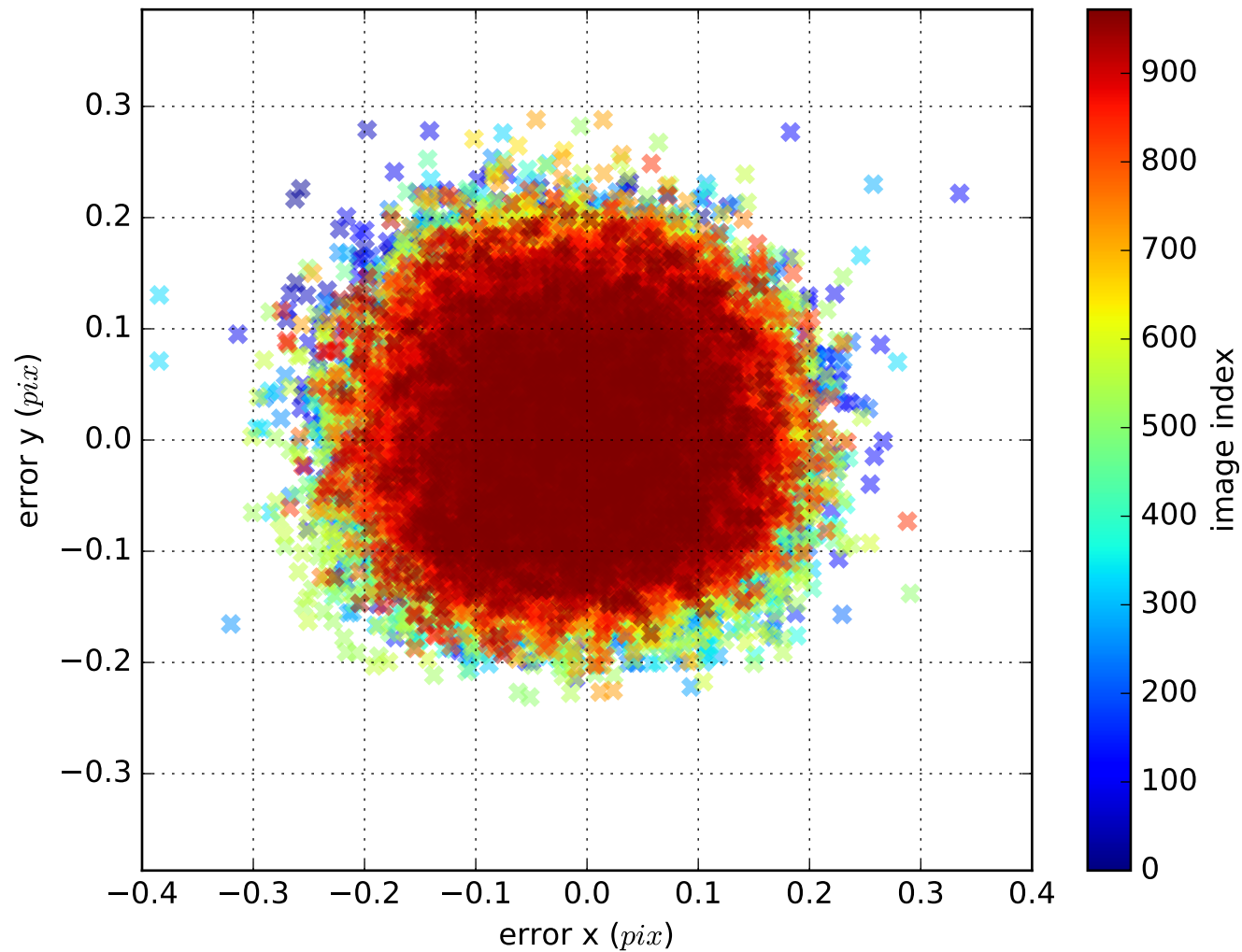
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

