

## Calibration results

=====

### Normalized Residuals

-----

Reprojection error (cam0): mean 0.164040082601, median 0.156347730859, std: 0.0855045108995  
Gyroscope error (imu0): mean 7.36496001634e-05, median 4.03174733631e-08, std: 0.00043542951998  
Accelerometer error (imu0): mean 0.000205344913818, median 0.000205388902607, std: 3.16167499425e-07

### Residuals

-----

Reprojection error (cam0) [px]: mean 0.164040082601, median 0.156347730859, std: 0.0855045108995  
Gyroscope error (imu0) [rad/s]: mean 1.50981680335e-06, median 8.26508203943e-10, std: 8.92630515959e-06  
Accelerometer error (imu0) [m/s^2]: mean 6.57103724218e-07, median 6.57244488343e-07, std: 1.01173599816e-09

### Transformation (cam0):

-----

T\_ci: (imu0 to cam0):

```
[[-0.00310208 -0.99991467 -0.01268994 0.0005295 ]  
 [-0.02954594 0.01277611 -0.99948177 -0.00063717]  
 [ 0.99955861 -0.00272554 -0.02958305 0.00034213]  
 [ 0.      0.      0.      1.    ]]
```

T\_ic: (cam0 to imu0):

```
[[-0.00310208 -0.02954594 0.99955861 -0.00035916]  
 [-0.99991467 0.01277611 -0.00272554 0.00053853]  
 [-0.01268994 -0.99948177 -0.02958305 -0.00062  ]  
 [ 0.      0.      0.      1.    ]]
```

timeshift cam0 to imu0: [s] ( $t_{imu} = t_{cam} + \text{shift}$ )

0.0

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

[-0.29454651 -9.77866661 -0.6777497 ]

### Calibration configuration

=====

cam0

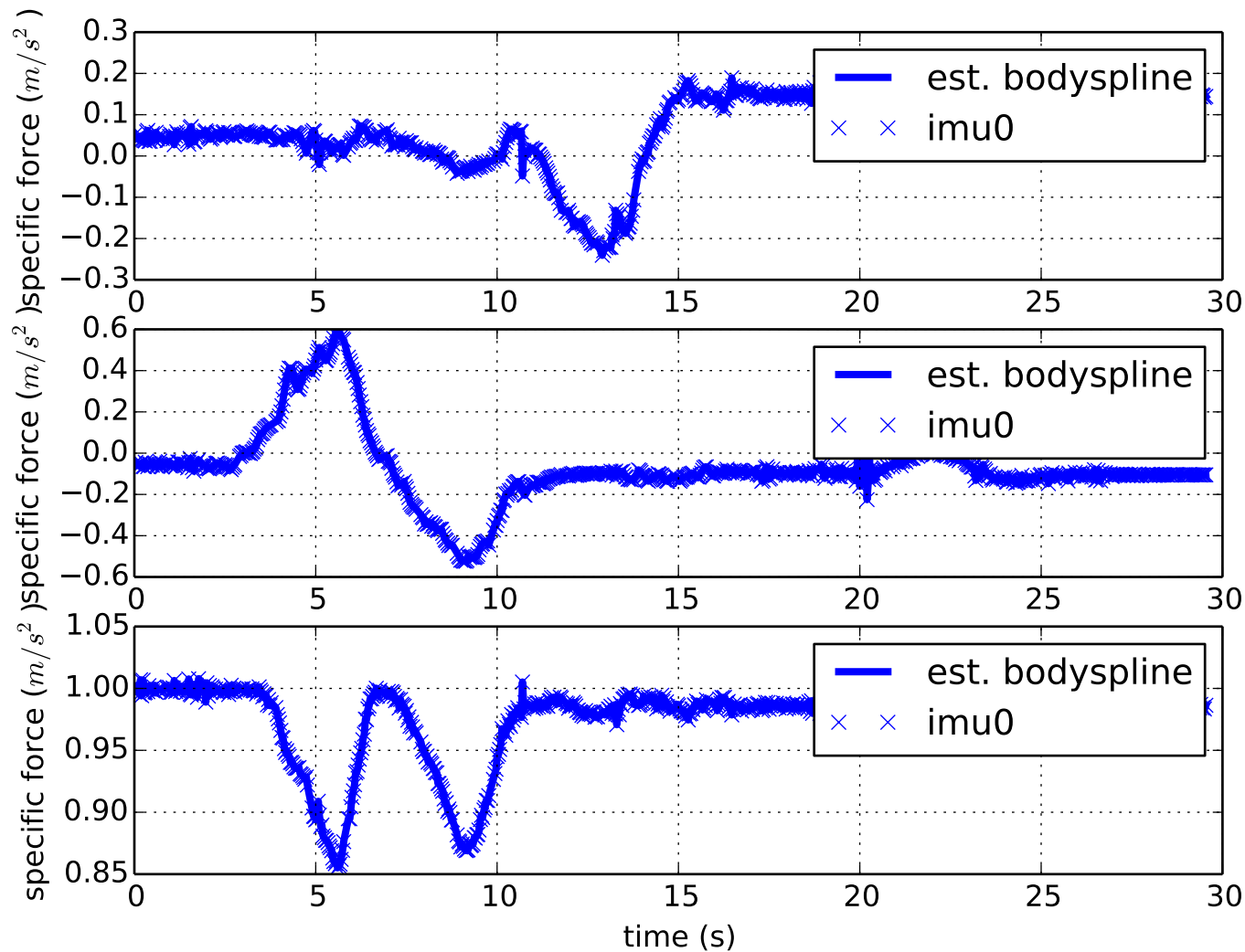
-----  
Camera model: omni  
Focal length: [411.4184, 412.0773]  
Principal point: [161.415, 101.9626]  
Omni xi: 3.282446  
Distortion model: radtan  
Distortion coefficients: [0.8560437616, 17.43165613, 0.0, 0.0]  
Type: aprilgrid  
Tags:  
  Rows: 6  
  Cols: 6  
  Size: 0.067 [m]  
  Spacing 0.0199995 [m]

IMU configuration  
=====

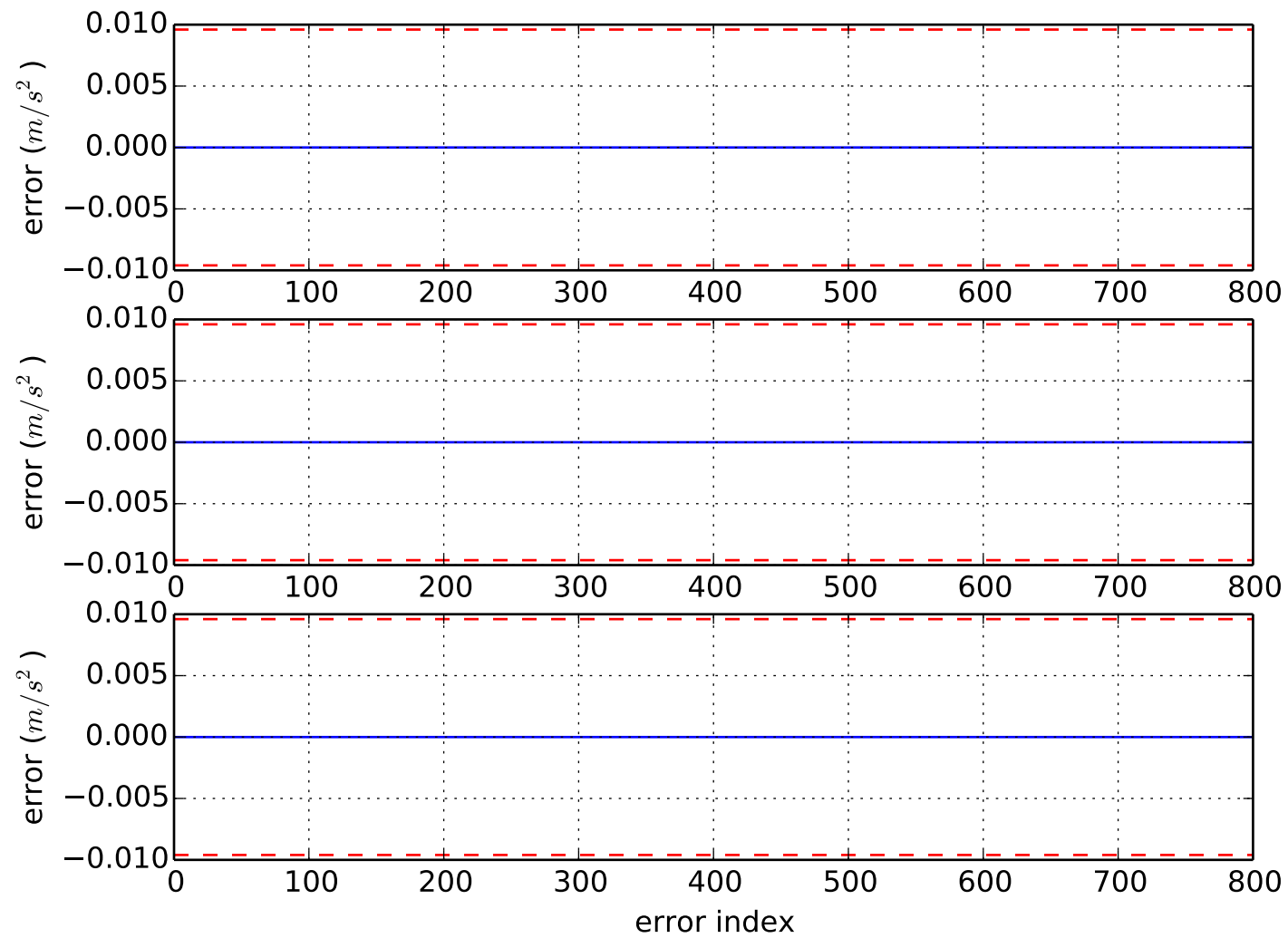
IMU0:

-----  
Model: calibrated  
Update rate: 25  
Accelerometer:  
  Noise density: 0.00064  
  Noise density (discrete): 0.0032  
  Random walk: 8.86e-07  
Gyroscope:  
  Noise density: 0.0041  
  Noise density (discrete): 0.0205  
  Random walk: 5.7e-07  
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]

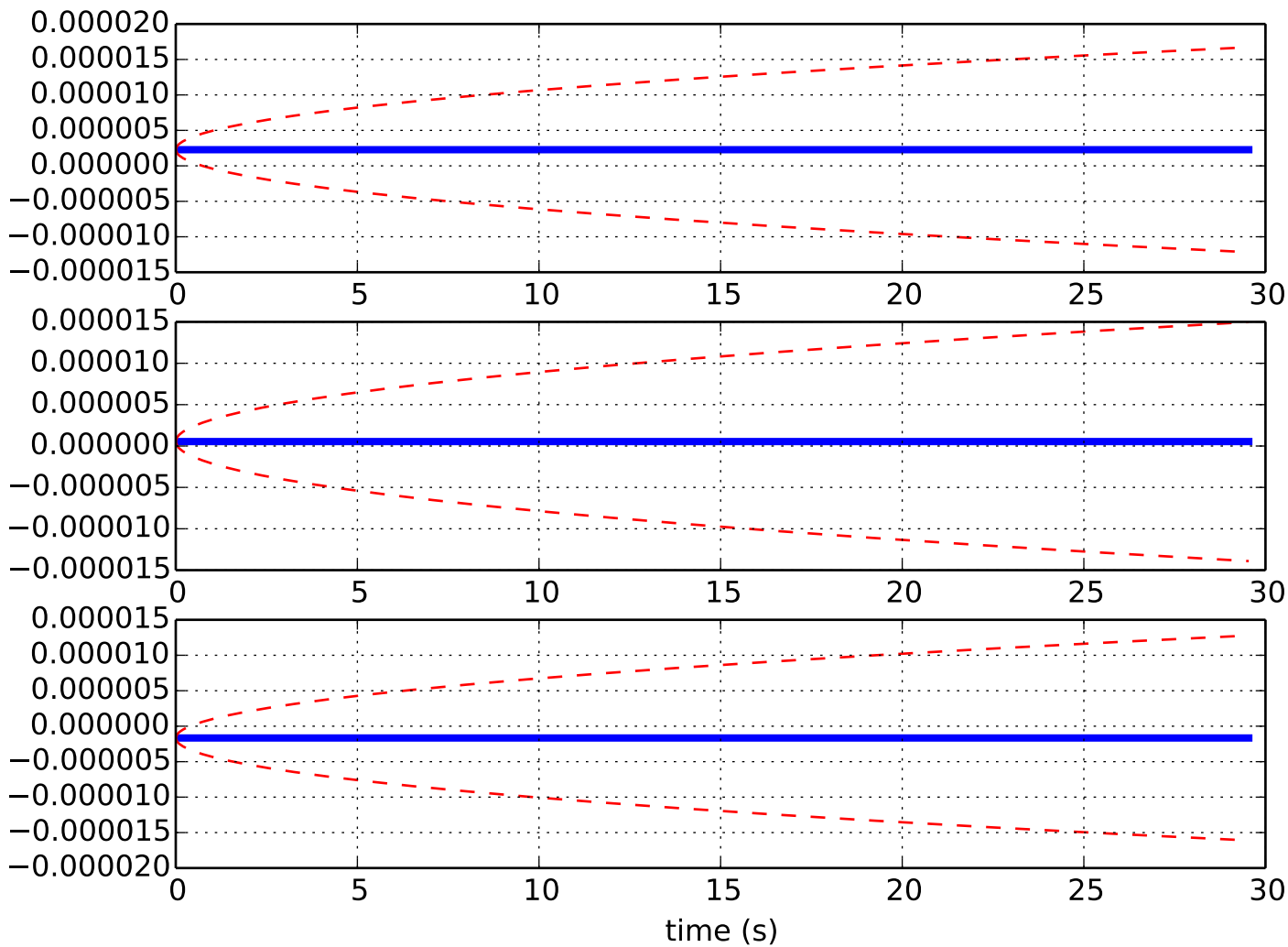
Comparison of predicted and measured specific force (imu0 frame)



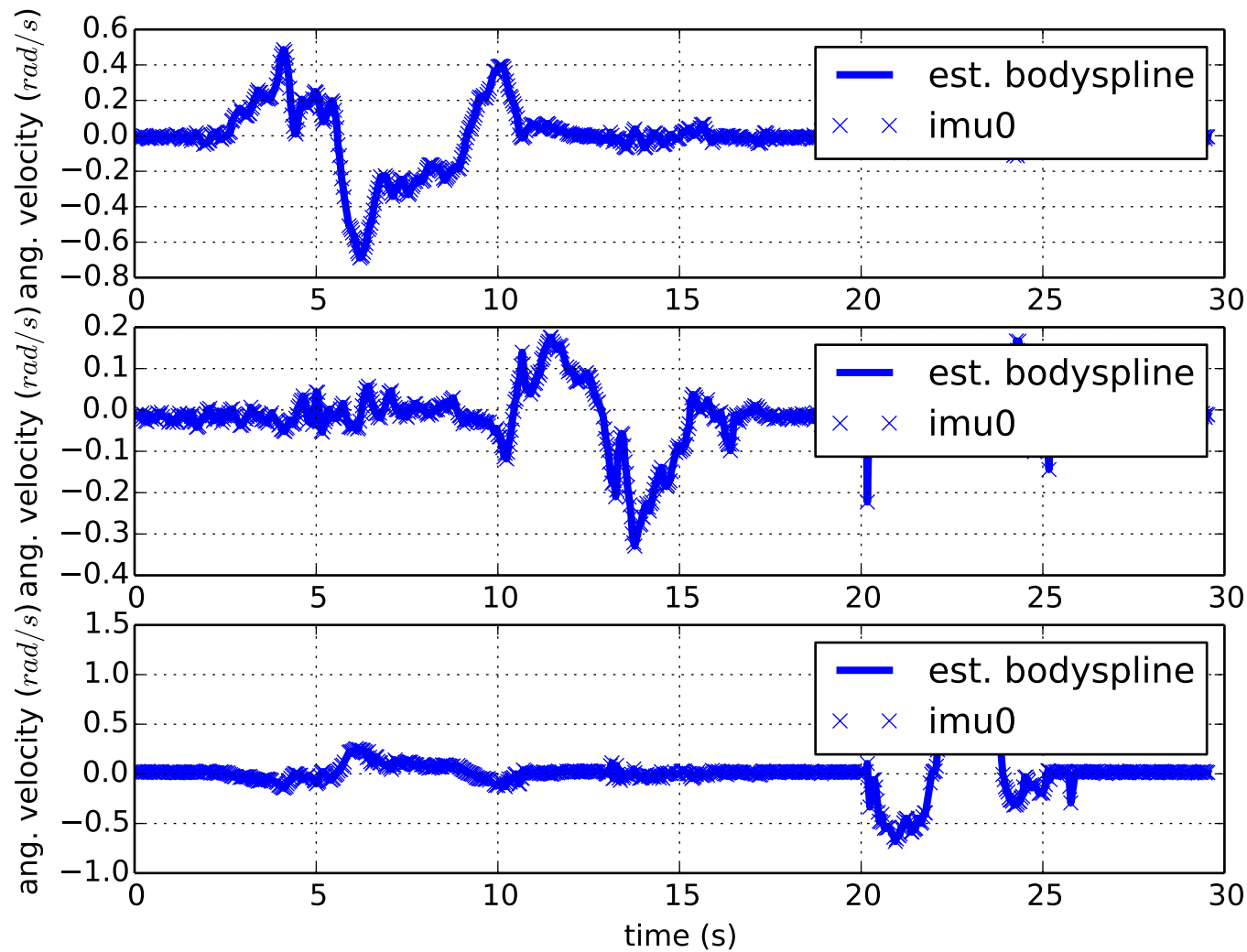
imu0: acceleration error



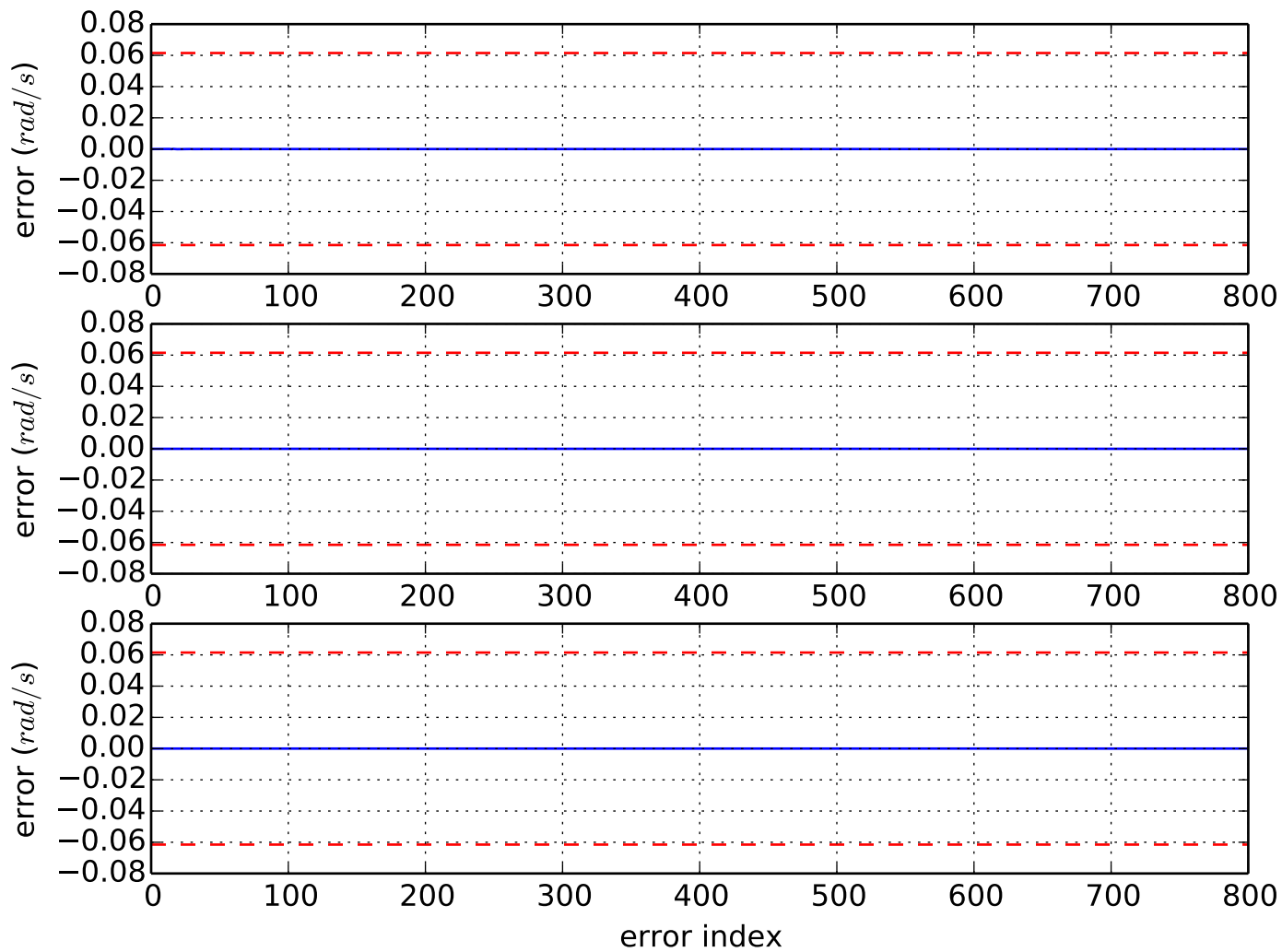
imu0: estimated accelerometer bias (imu frame)



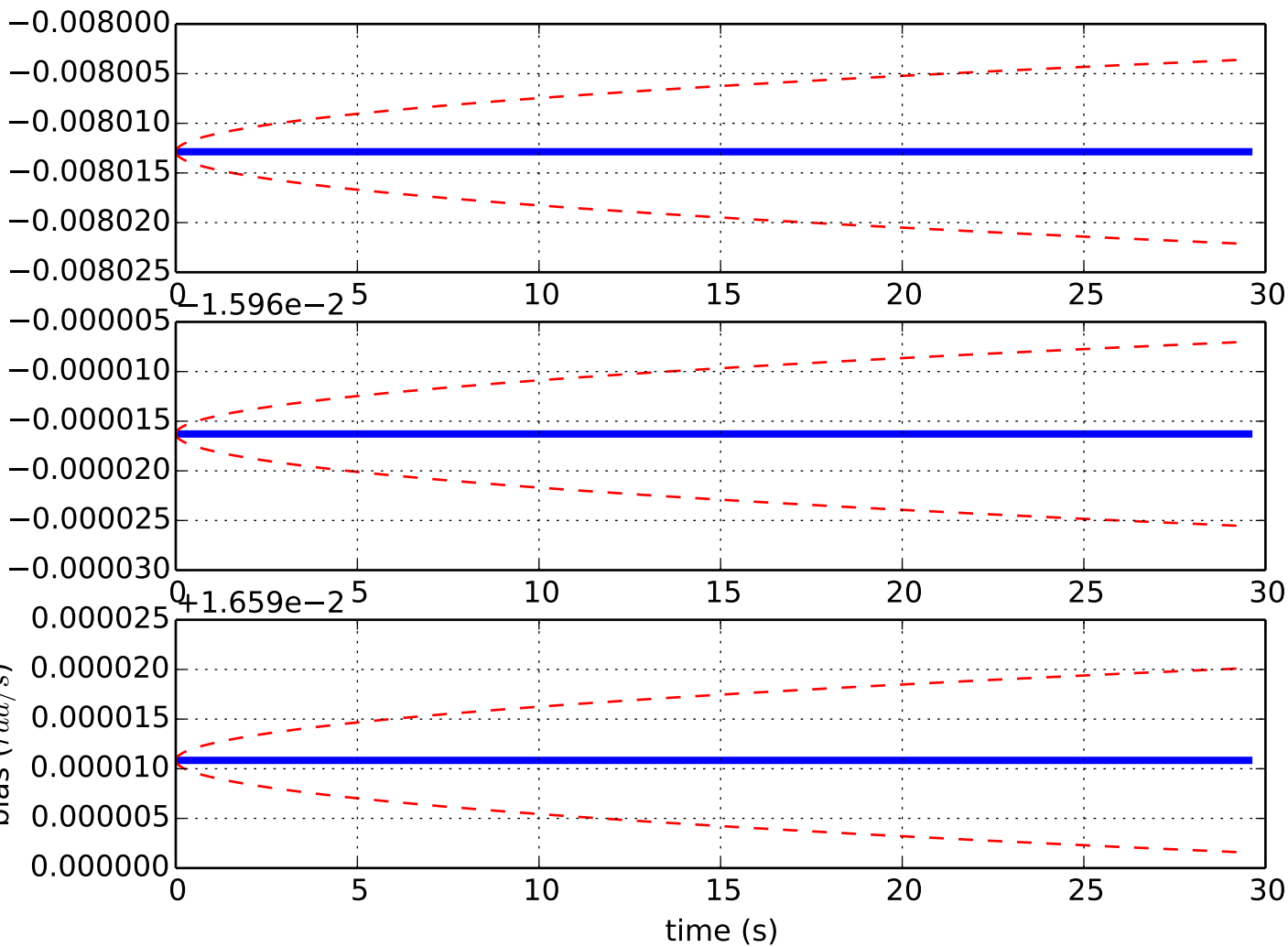
Comparison of predicted and measured angular velocities (body frame)



imu0: angular velocities error



imu0: estimated gyro bias (imu frame)





cam0: reprojection errors

