

## Calibration results

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### Normalized Residuals

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Reprojection error (cam0): mean 8.1274298291, median 7.63266998875, std: 4.27635253105  
Gyroscope error (imu0): mean 0.0103768281206, median 2.3828984599e-07, std: 0.0793470247141  
Accelerometer error (imu0): mean 0.00532708136785, median 0.00532446065886, std: 7.10198731557e-05

### Residuals

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Reprojection error (cam0) [px]: mean 8.1274298291, median 7.63266998875, std: 4.27635253105  
Gyroscope error (imu0) [rad/s]: mean 0.000212724976472, median 4.8849418428e-09, std: 0.00162661400664  
Accelerometer error (imu0) [m/s<sup>2</sup>]: mean 1.70466603771e-05, median 1.70382741083e-05, std: 2.27263594098e-07

### Transformation (cam0):

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T\_ci: (imu0 to cam0):

```
[[-0.15526983  0.98425663  0.08444035  0.00146733]
 [-0.24254547 -0.12084343  0.96258431  0.00126424]
 [ 0.95763405  0.12897968  0.25749032 -0.00051551]
 [ 0.          0.          0.          1.        ]]
```

T\_ic: (cam0 to imu0):

```
[[-0.15526983 -0.24254547  0.95763405  0.00102814]
 [ 0.98425663 -0.12084343  0.12897968 -0.00122496]
 [ 0.08444035  0.96258431  0.25749032 -0.0012081 ]
 [ 0.          0.          0.          1.        ]]
```

timeshift cam0 to imu0: [s] (t\_imu = t\_cam + shift)

0.0

Gravity vector in target coords: [m/s<sup>2</sup>]

[-1.34697545 9.47992287 -2.11781548]

### Calibration configuration

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cam0

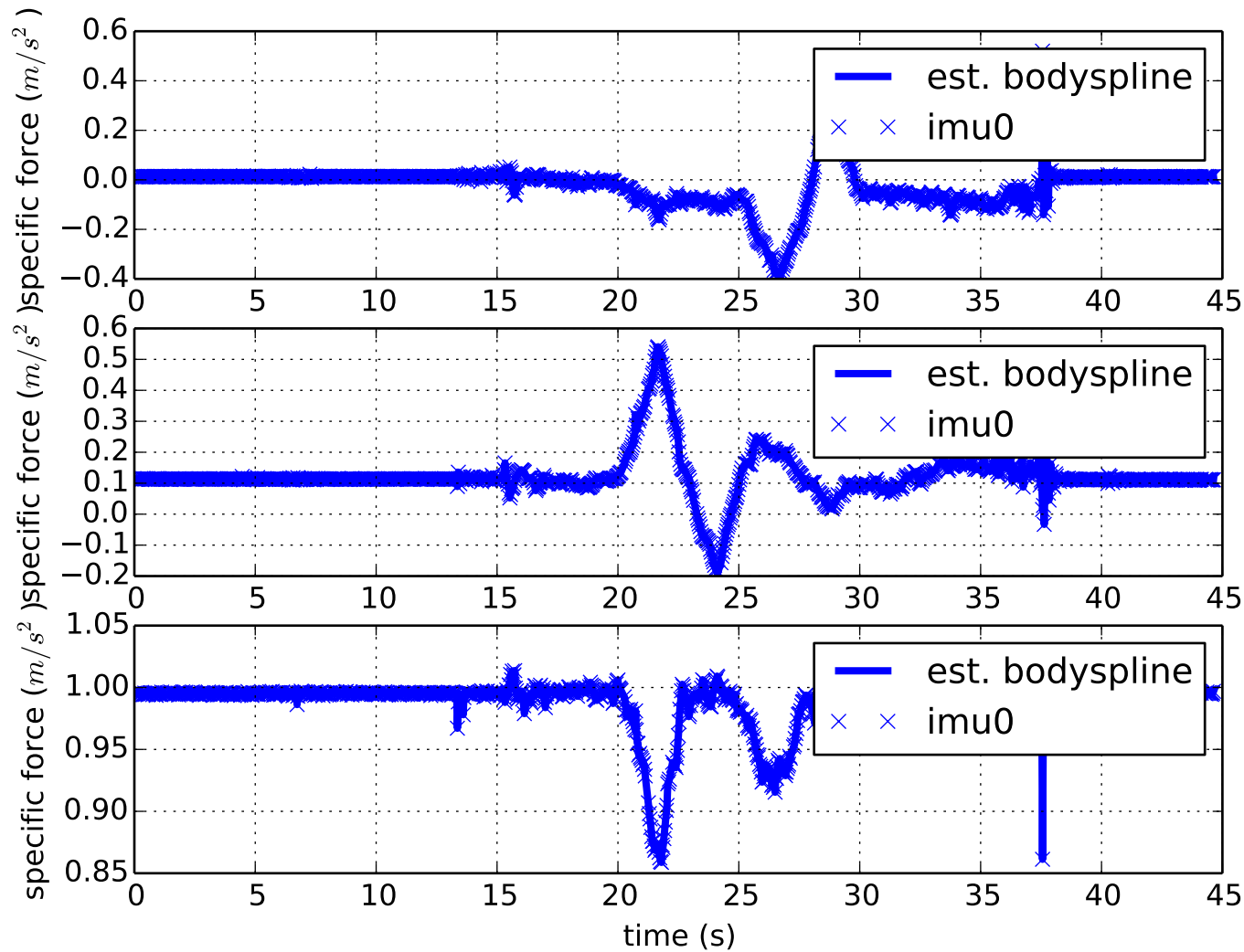
-----  
Camera model: pinhole  
Focal length: [206.6688, 206.9523]  
Principal point: [326.0185, 205.8282]  
Distortion model: equidistant  
Distortion coefficients: [1.2828, 0.0304, 0.0166, -0.0138]  
Type: aprilgrid  
Tags:  
  Rows: 6  
  Cols: 6  
  Size: 0.03 [m]  
  Spacing 0.00999 [m]

IMU configuration  
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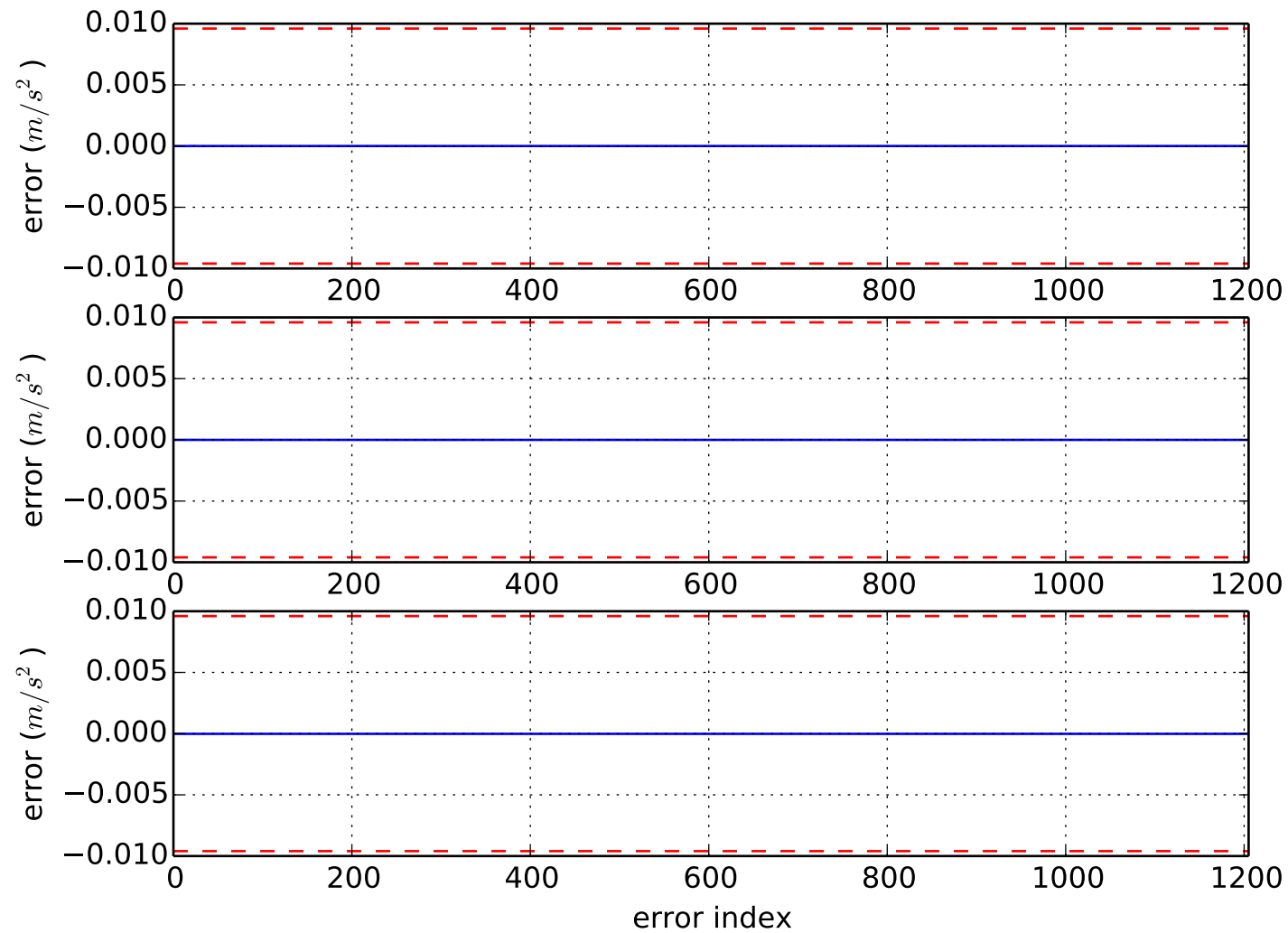
IMU0:  
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Model: calibrated  
Update rate: 25  
Accelerometer:  
  Noise density: 0.00064  
  Noise density (discrete): 0.0032  
  Random walk: 8.86e-07  
Gyroscope:  
  Noise density: 0.0041  
  Noise density (discrete): 0.0205  
  Random walk: 5.7e-07  
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]

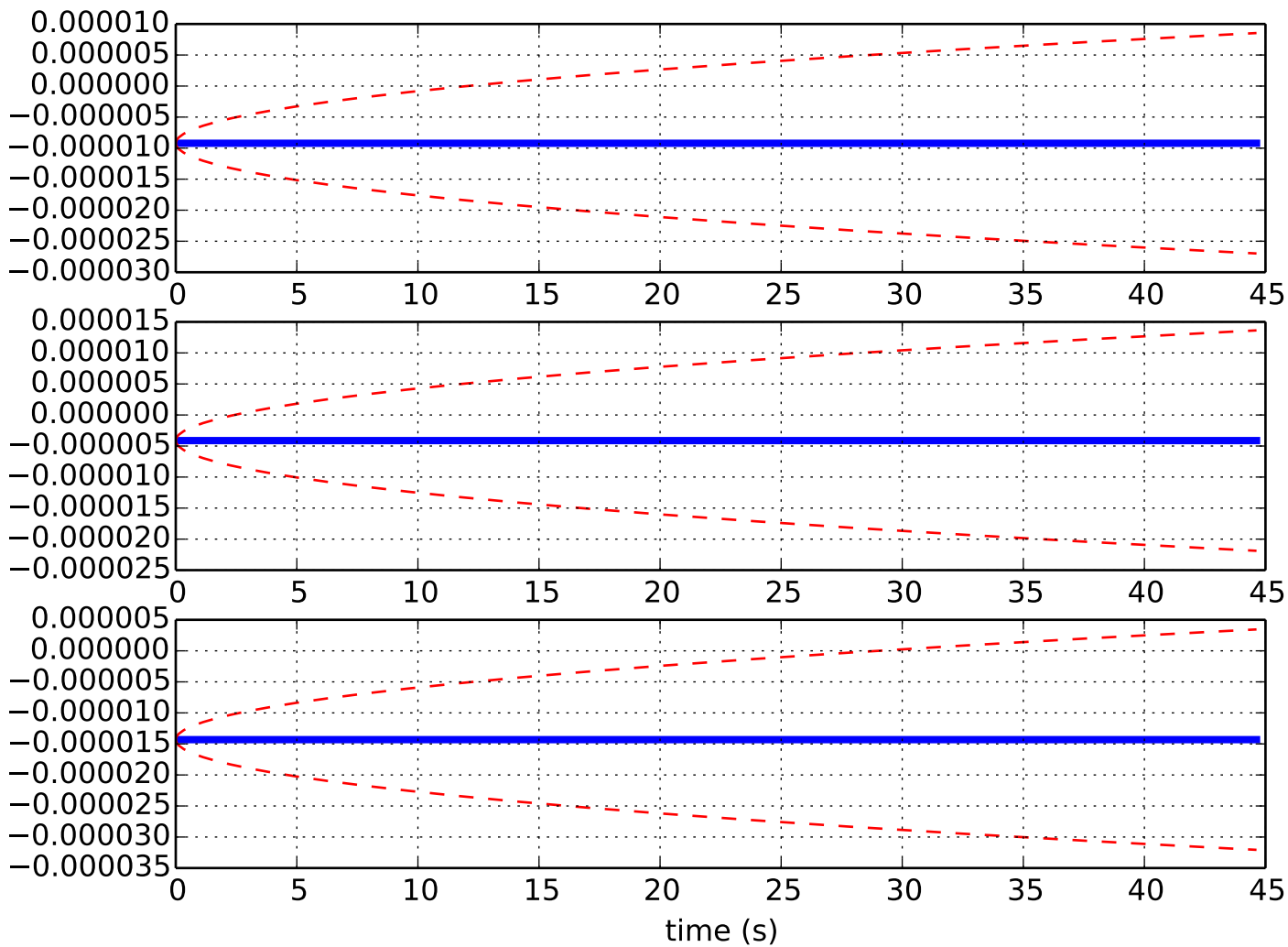
Comparison of predicted and measured specific force (imu0 frame)



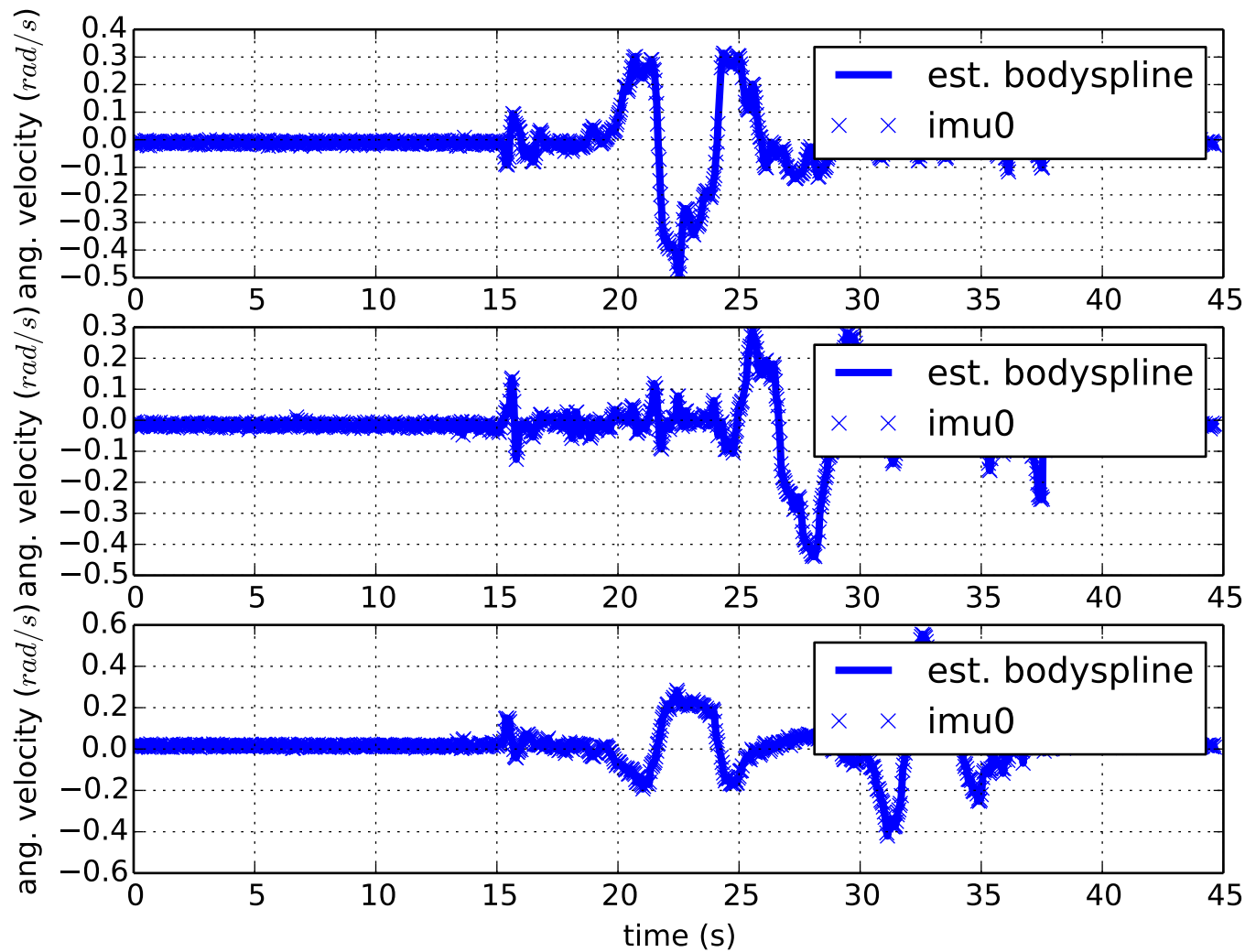
imu0: acceleration error



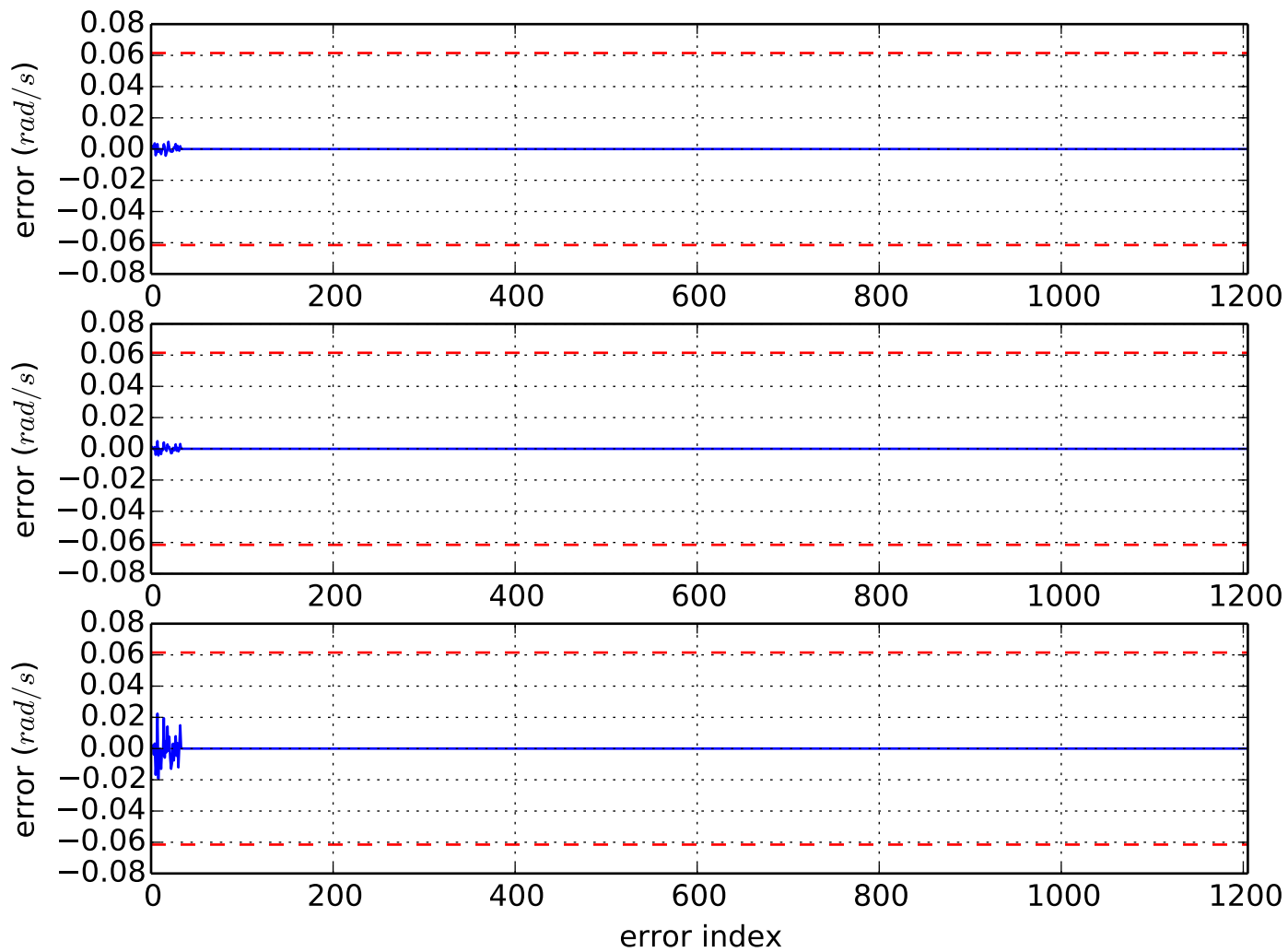
imu0: estimated accelerometer bias (imu frame)



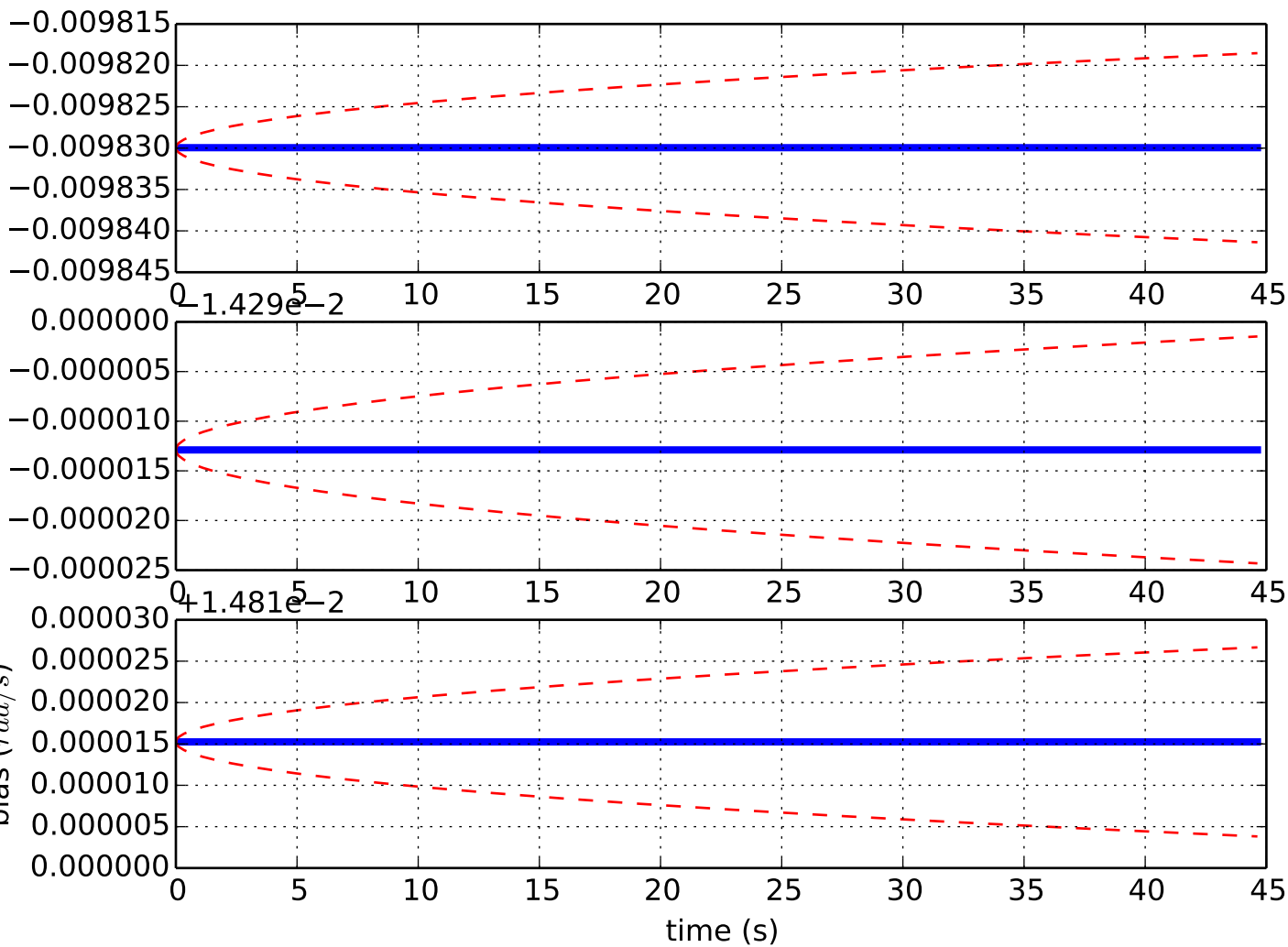
Comparison of predicted and measured angular velocities (body frame)



imu0: angular velocities error



imu0: estimated gyro bias (imu frame)





cam0: reprojection errors

