

## Calibration results

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### Normalized Residuals

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Reprojection error (cam0): mean 0.394806814333, median 0.298034866683, std: 0.33469033674

Gyroscope error (imu0): mean 0.402020401631, median 0.354353330375, std: 0.239037518976

Accelerometer error (imu0): mean 0.290539993479, median 0.252299355353, std: 0.183004460975

### Residuals

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Reprojection error (cam0) [px]: mean 0.394806814333, median 0.298034866683, std: 0.33469033674

Gyroscope error (imu0) [rad/s]: mean 0.127130013501, median 0.112056362045, std: 0.0755903006199

Accelerometer error (imu0) [m/s^2]: mean 0.229692032691, median 0.199460153777, std: 0.144677729663

### Transformation (cam0):

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T\_ci: (imu0 to cam0):

[[ 0.99998056 0.00596046 -0.00183104 0.05154619]

[ 0.00596532 -0.99997867 0.00265875 0.05029664]

[-0.00181515 -0.00266963 -0.99999479 -0.04450062]

[ 0. 0. 0. 1. ]]

T\_ic: (cam0 to imu0):

[[ 0.99998056 0.00596532 -0.00181515 -0.05192599]

[ 0.00596046 -0.99997867 -0.00266963 0.04986953]

[-0.00183104 0.00265875 -0.99999479 -0.04453973]

[ 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]

[ 9.22208698 -0.0901903 -3.3336767 ]

### Calibration configuration

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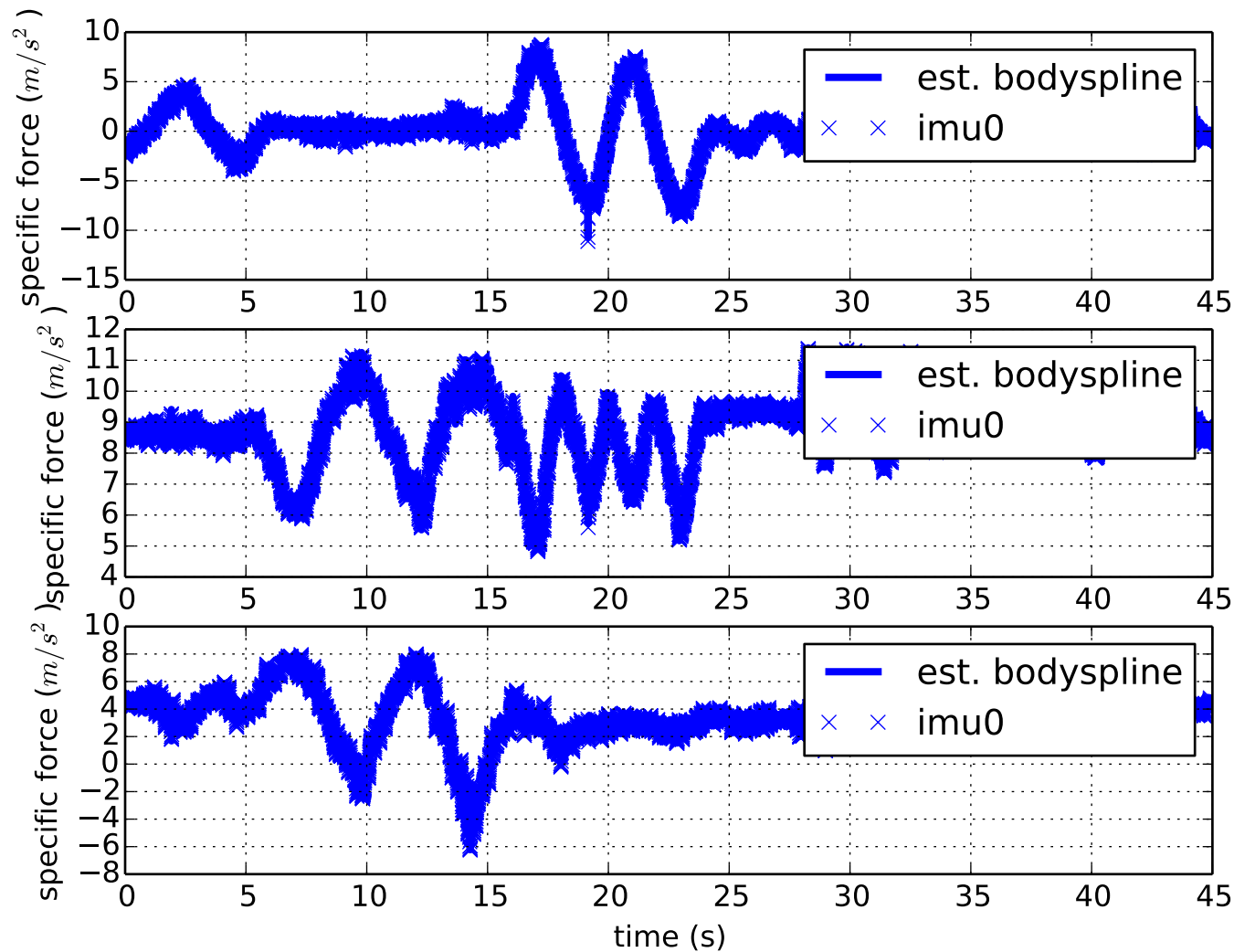
cam0

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Camera model: pinhole  
Focal length: [475.03888642, 474.29264844]  
Principal point: [219.85007813, 311.58477823]  
Distortion model: radtan  
Distortion coefficients: [0.29167299, -0.6072107, -0.00083053, 0.00087051]  
Type: checkerboard  
Rows  
  Count: 7  
  Distance: 0.035 [m]  
Cols  
  Count: 8  
  Distance: 0.035 [m]

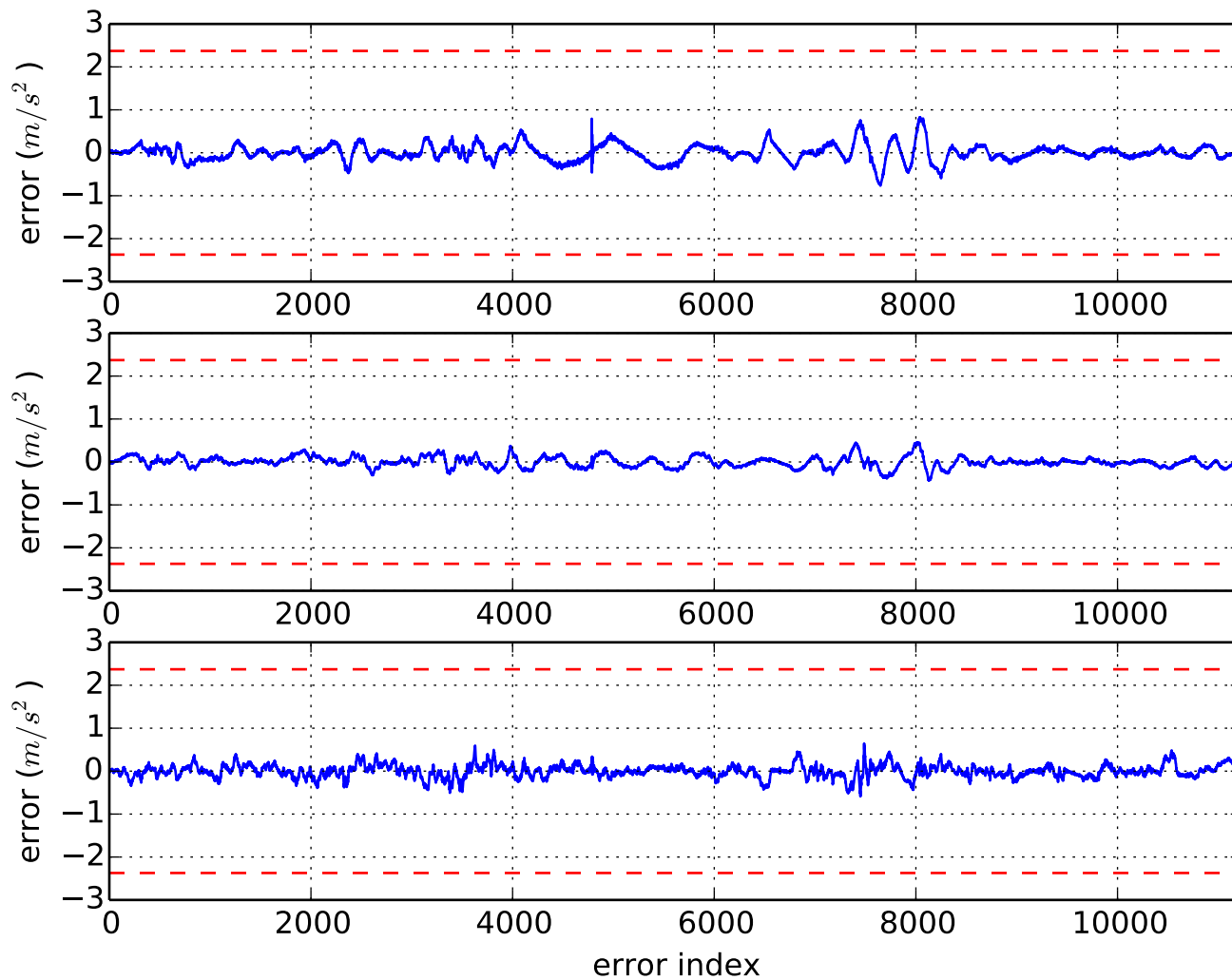
IMU configuration  
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IMU0:  
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Model: calibrated  
Update rate: 250.0  
Accelerometer:  
  Noise density: 0.05  
  Noise density (discrete): 0.790569415042  
  Random walk: 0.001  
Gyroscope:  
  Noise density: 0.02  
  Noise density (discrete): 0.316227766017  
  Random walk: 4e-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]

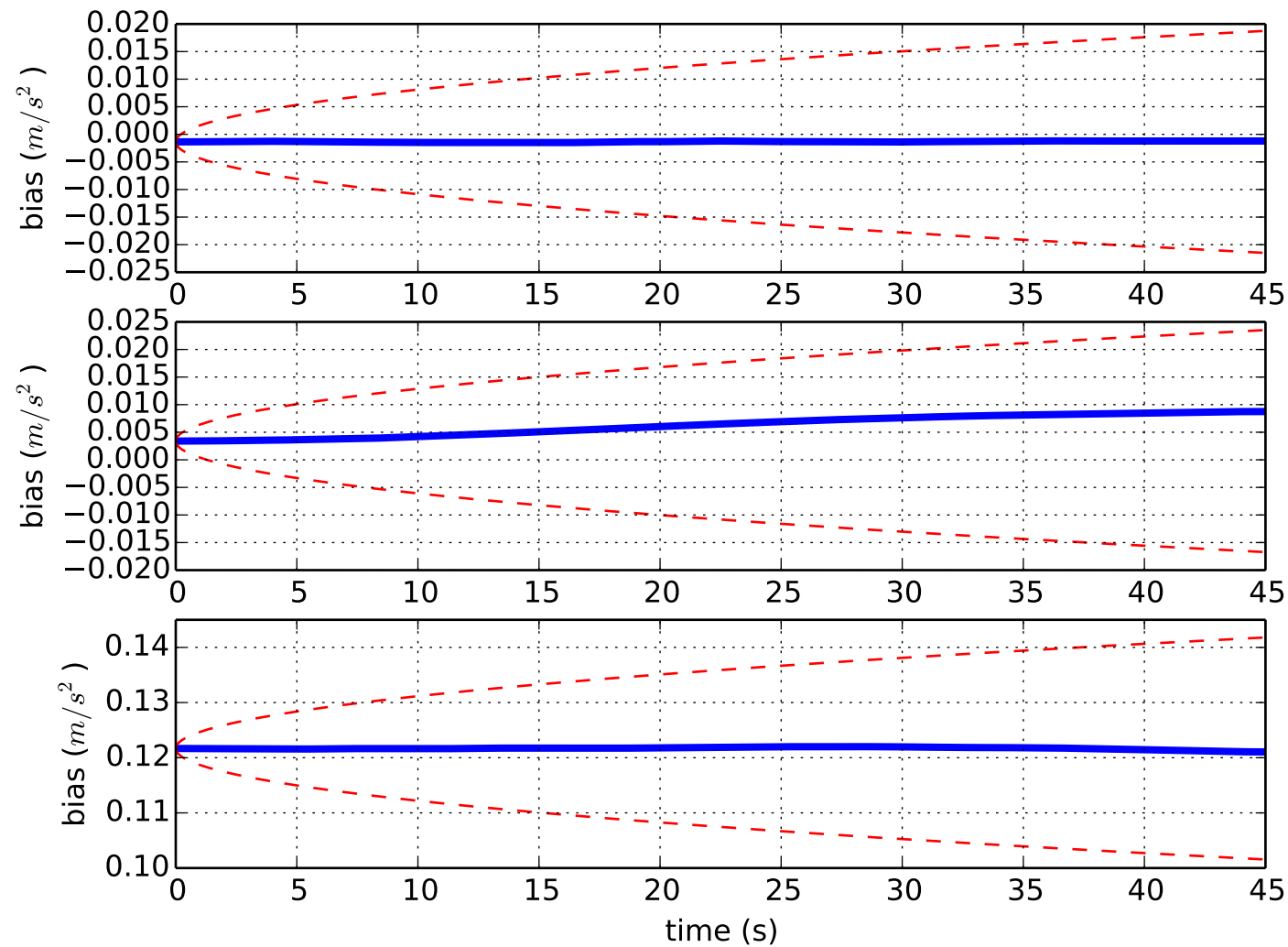
Comparison of predicted and measured specific force (imu0 frame)



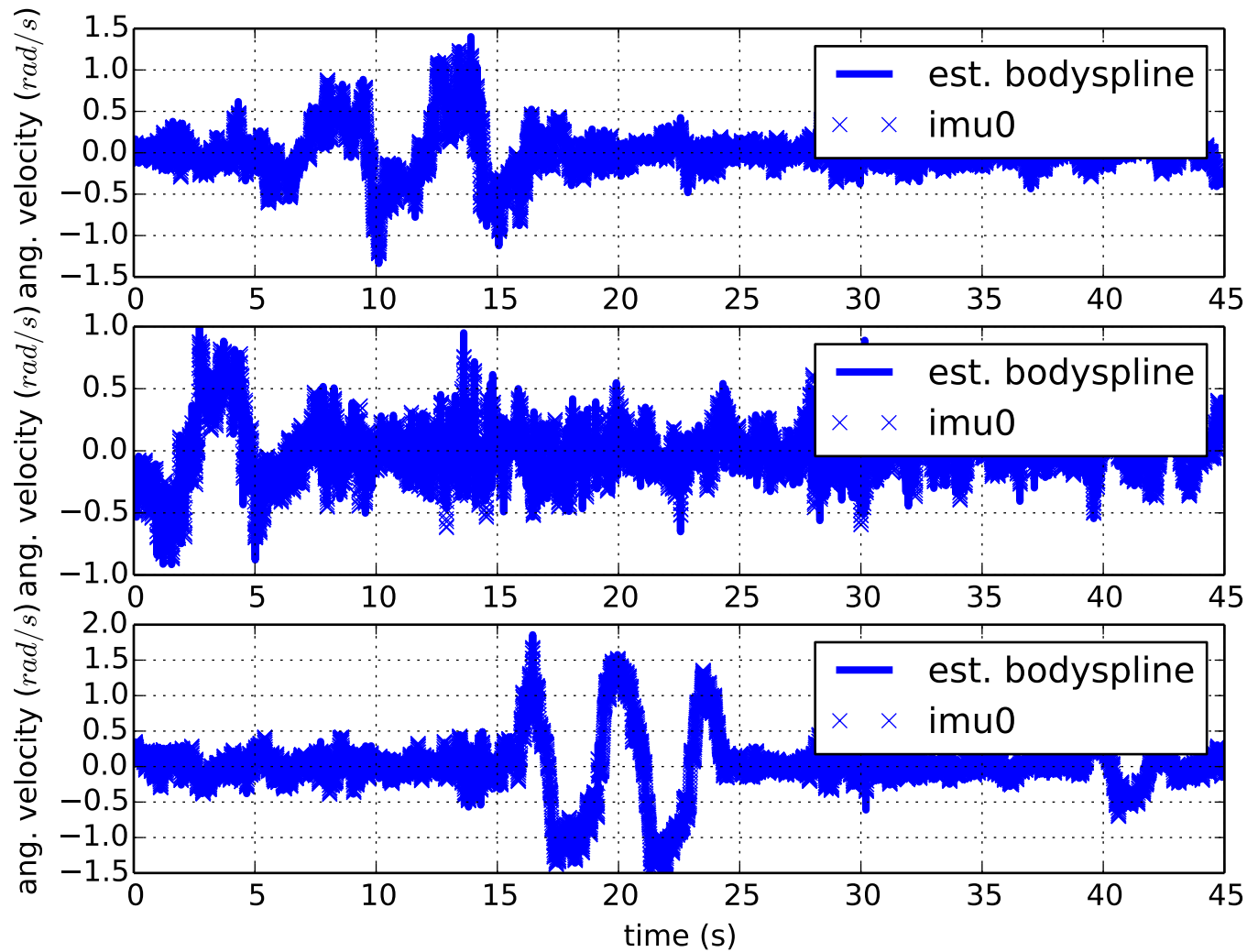
imu0: acceleration error



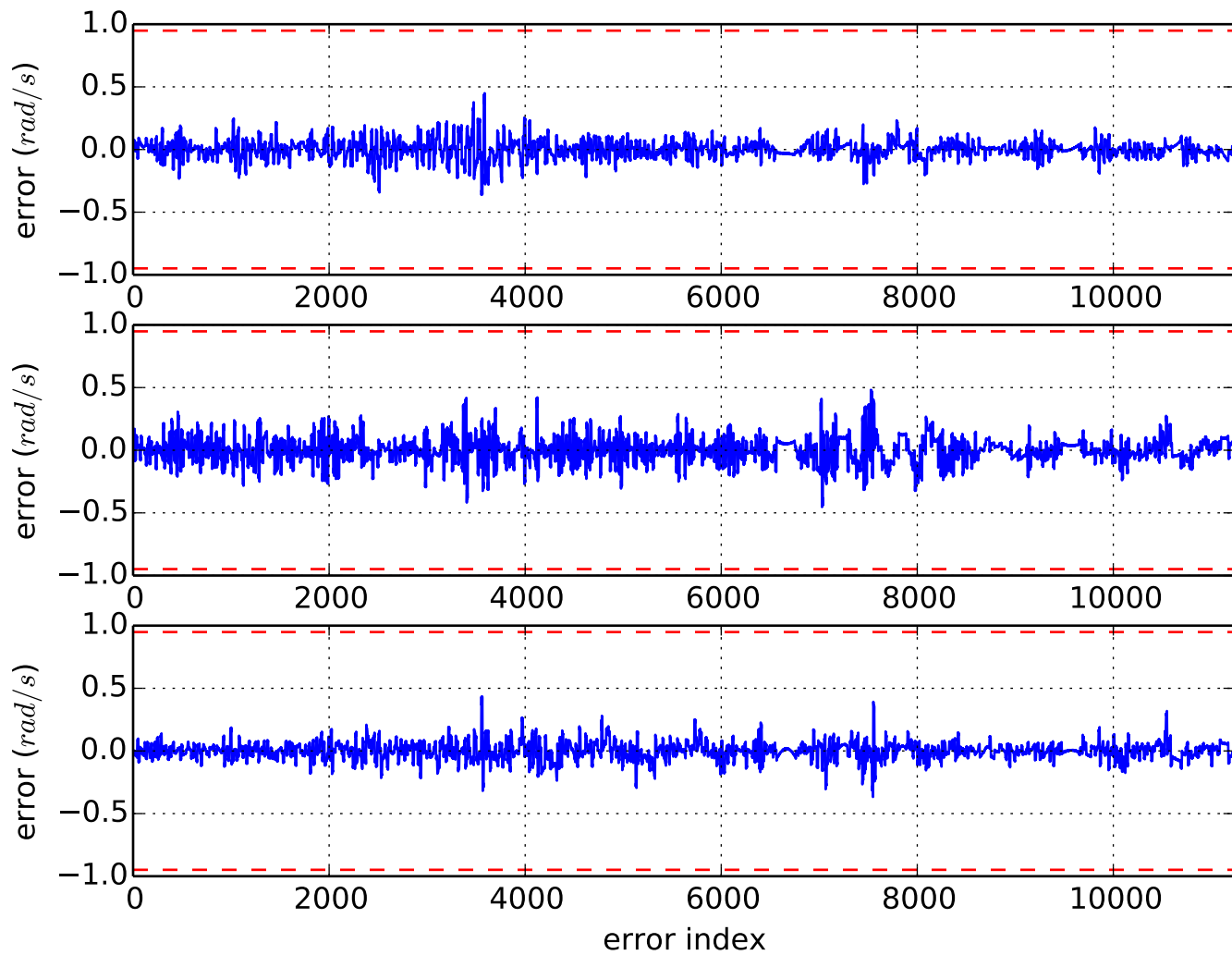
imu0: estimated accelerometer bias (imu frame)



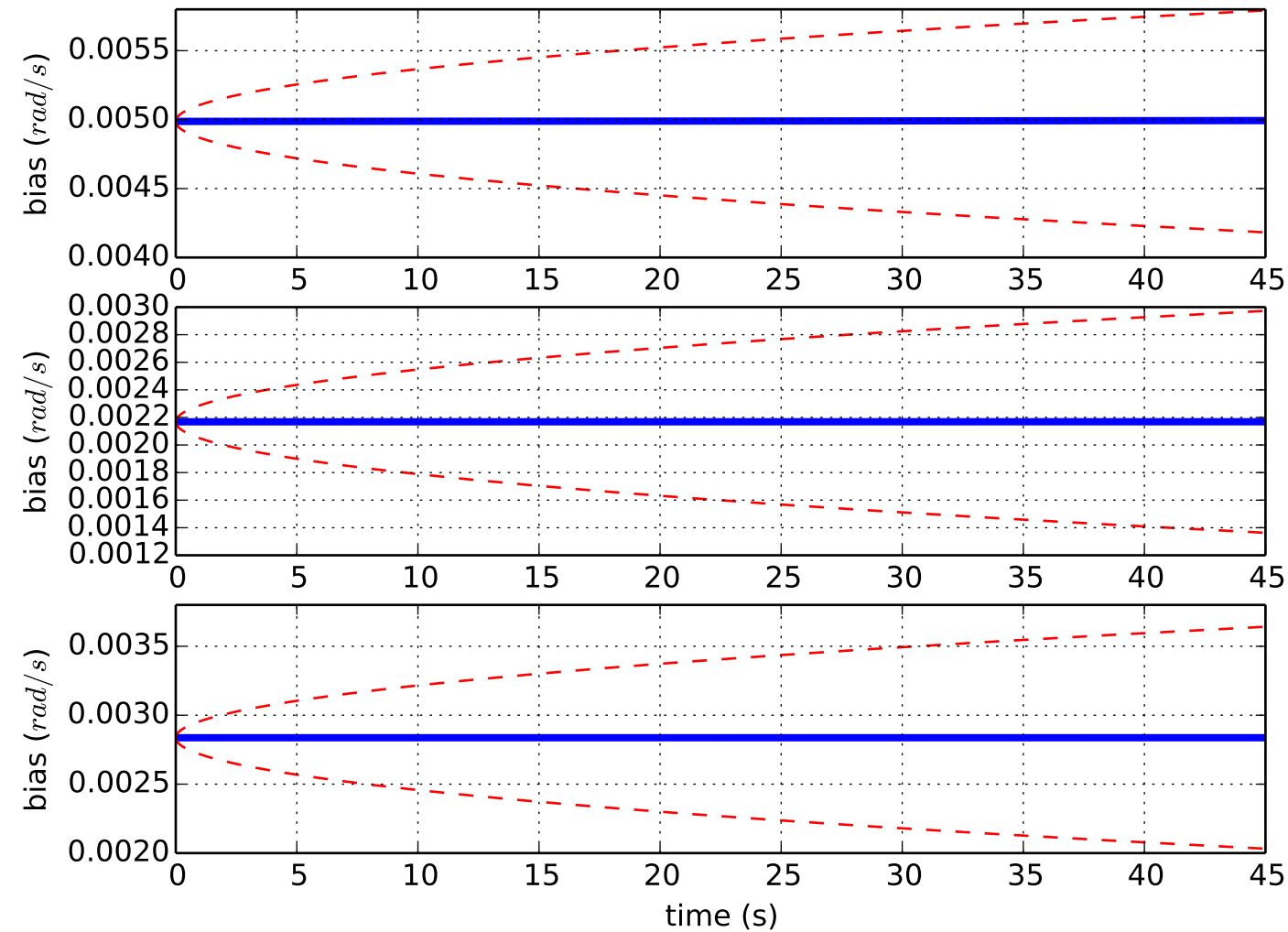
Comparison of predicted and measured angular velocities (body frame)



imu0: angular velocities error



imu0: estimated gyro bias (imu frame)





cam0: reprojection errors

