

## Calibration results

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### Normalized Residuals

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Reprojection error (cam0): mean 0.668274461998, median 0.481523967314, std: 0.773459807783

Gyroscope error (imu0): mean 2.51319408028, median 0.680145284382, std: 5.18022290966

Accelerometer error (imu0): mean 0.912204853755, median 0.201830760274, std: 2.07949384291

### Residuals

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Reprojection error (cam0) [px]: mean 0.668274461998, median 0.481523967314, std: 0.773459807783

Gyroscope error (imu0) [rad/s]: mean 0.0904145692286, median 0.0244688794164, std: 0.186363491208

Accelerometer error (imu0) [m/s<sup>2</sup>]: mean 0.370945301174, median 0.0820738585721, std: 0.845619782305

### Transformation (cam0):

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T\_ci: (imu0 to cam0):

[[ 0.28460673 -0.66740685 -0.68816212 -0.12849895]

[ 0.92173752 -0.00675148 0.38775555 0.13315853]

[-0.26343682 -0.74466269 0.61325241 0.32129377]

[ 0. 0. 0. 1. ]]

T\_ic: (cam0 to imu0):

[[ 0.28460673 0.92173752 -0.26343682 -0.00152494]

[-0.66740685 -0.00675148 -0.74466269 0.15439343]

[-0.68816212 0.38775555 0.61325241 -0.33709525]

[ 0. 0. 0. 1. ]]

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

-0.538154582641

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

[ 3.62798686 7.91334522 4.51498634]

### Calibration configuration

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cam0

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Camera model: pinhole  
Focal length: [530.00468109, 521.86027041]  
Principal point: [428.96714026, 248.36783979]  
Distortion model: equidistant  
Distortion coefficients: [0.31205856, 0.23307093, -0.13151944, 0.12435412]  
Type: aprilgrid  
Tags:  
  Rows: 6  
  Cols: 6  
  Size: 0.072 [m]  
  Spacing 0.0216 [m]

#### IMU configuration

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#### IMU0:

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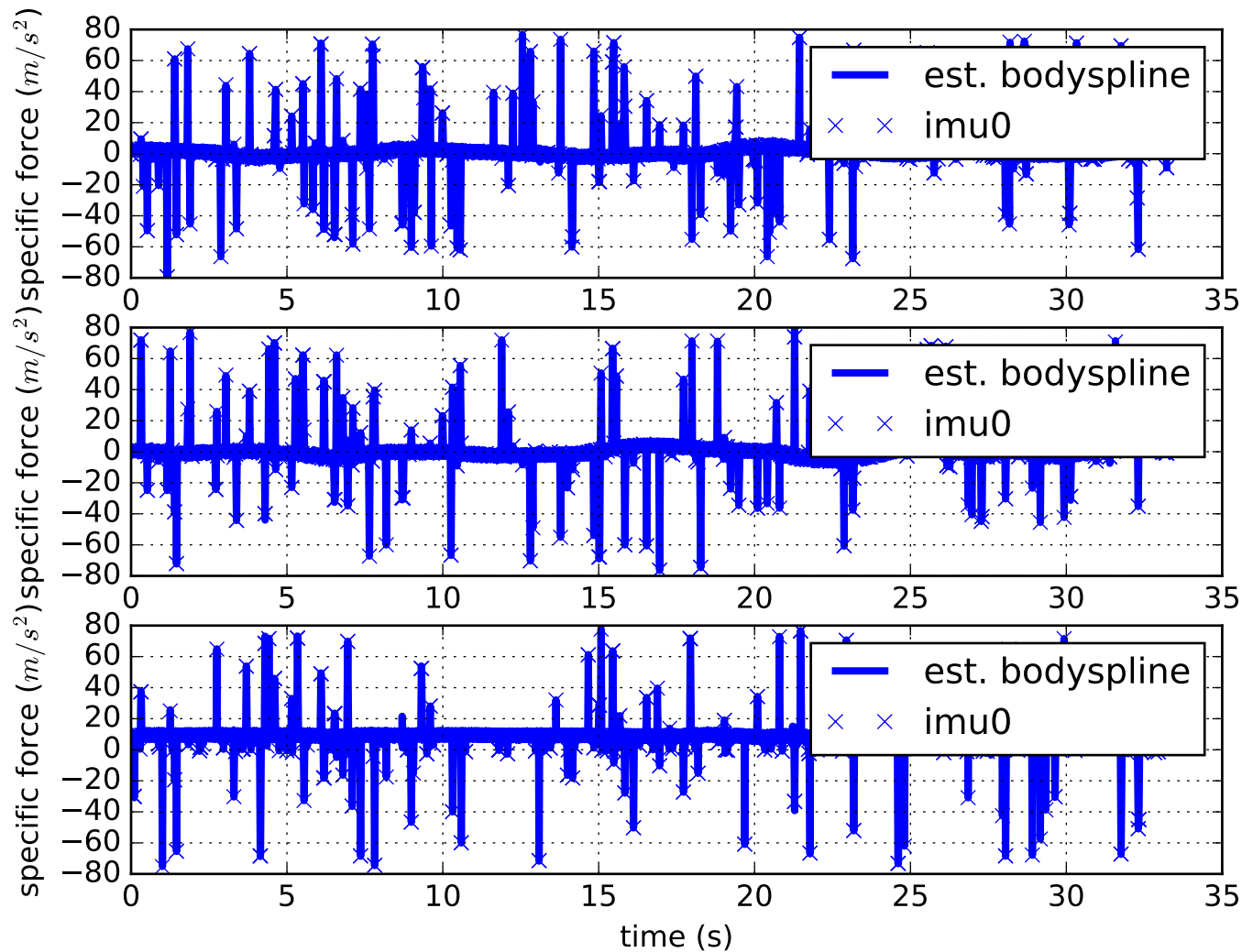
Model: calibrated  
Update rate: 100.0  
Accelerometer:  
  Noise density: 0.0406646927658  
  Noise density (discrete): 0.406646927658  
  Random walk: 0.00311311645065  
Gyroscope:  
  Noise density: 0.00359759598107  
  Noise density (discrete): 0.0359759598107  
  Random walk: 0.000114424620336

#### T<sub>i\_b</sub>

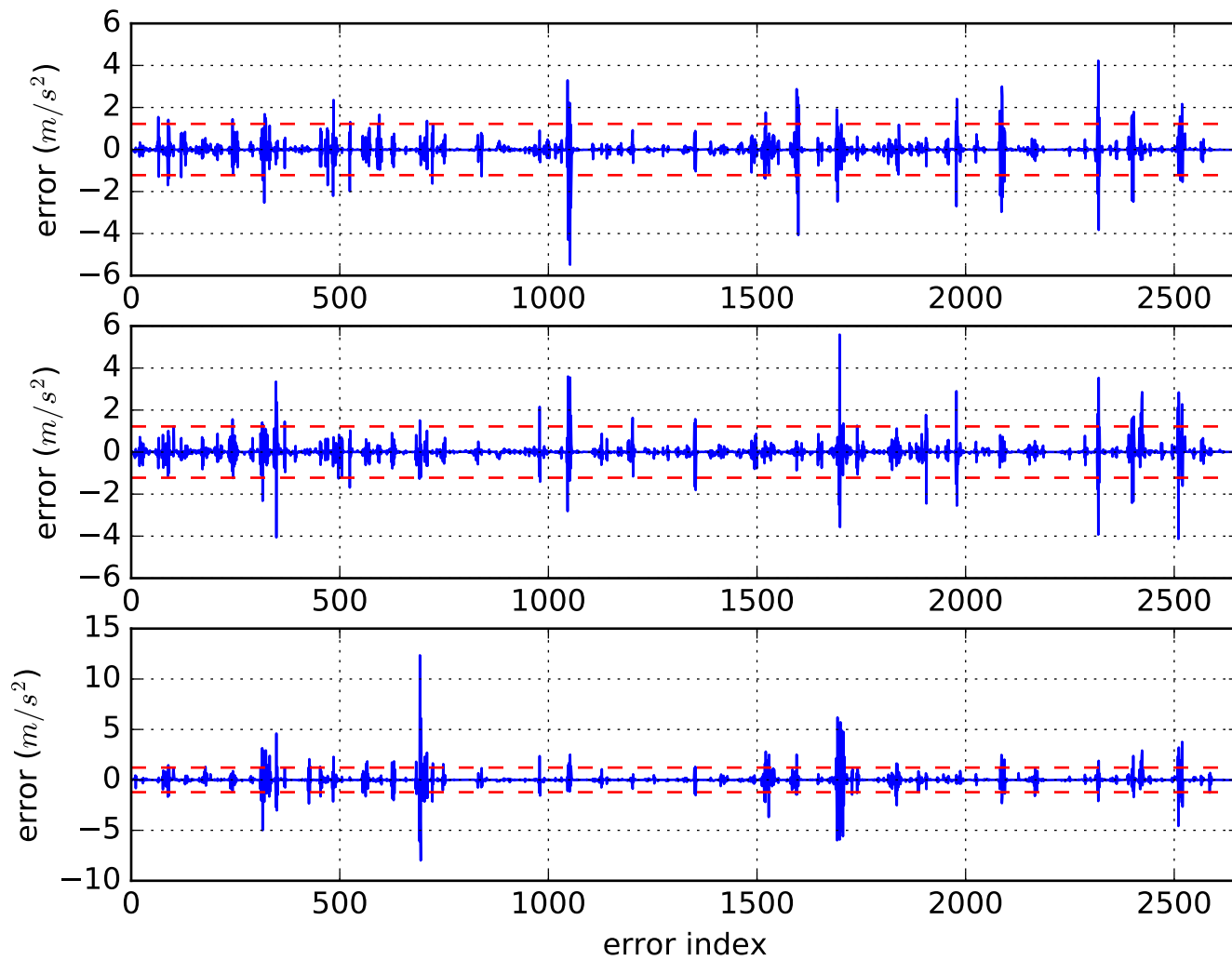
[[ 1. 0. 0. 0.]  
 [ 0. 1. 0. 0.]  
 [ 0. 0. 1. 0.]  
 [ 0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

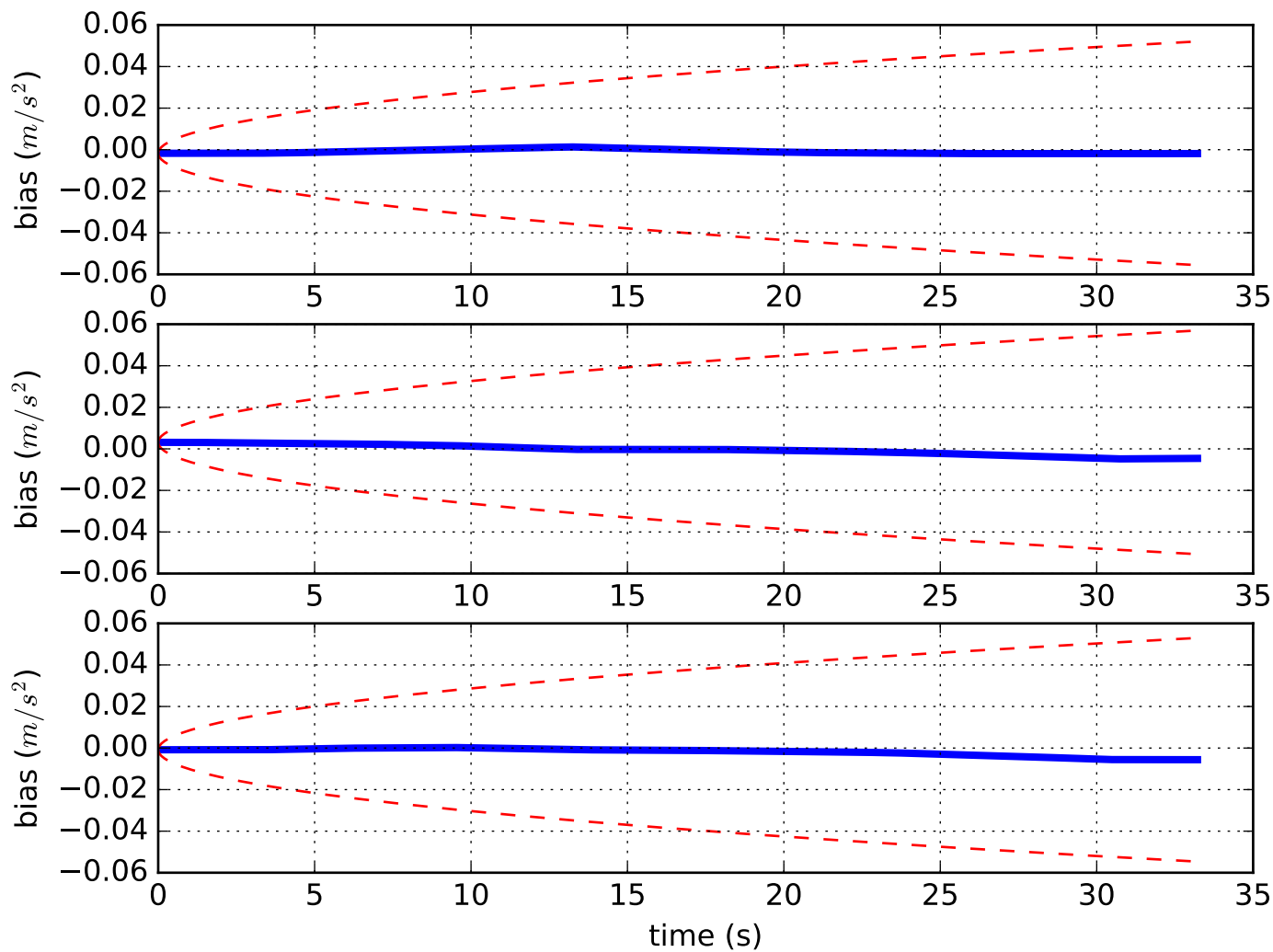
Comparison of predicted and measured specific force (imu0 frame)



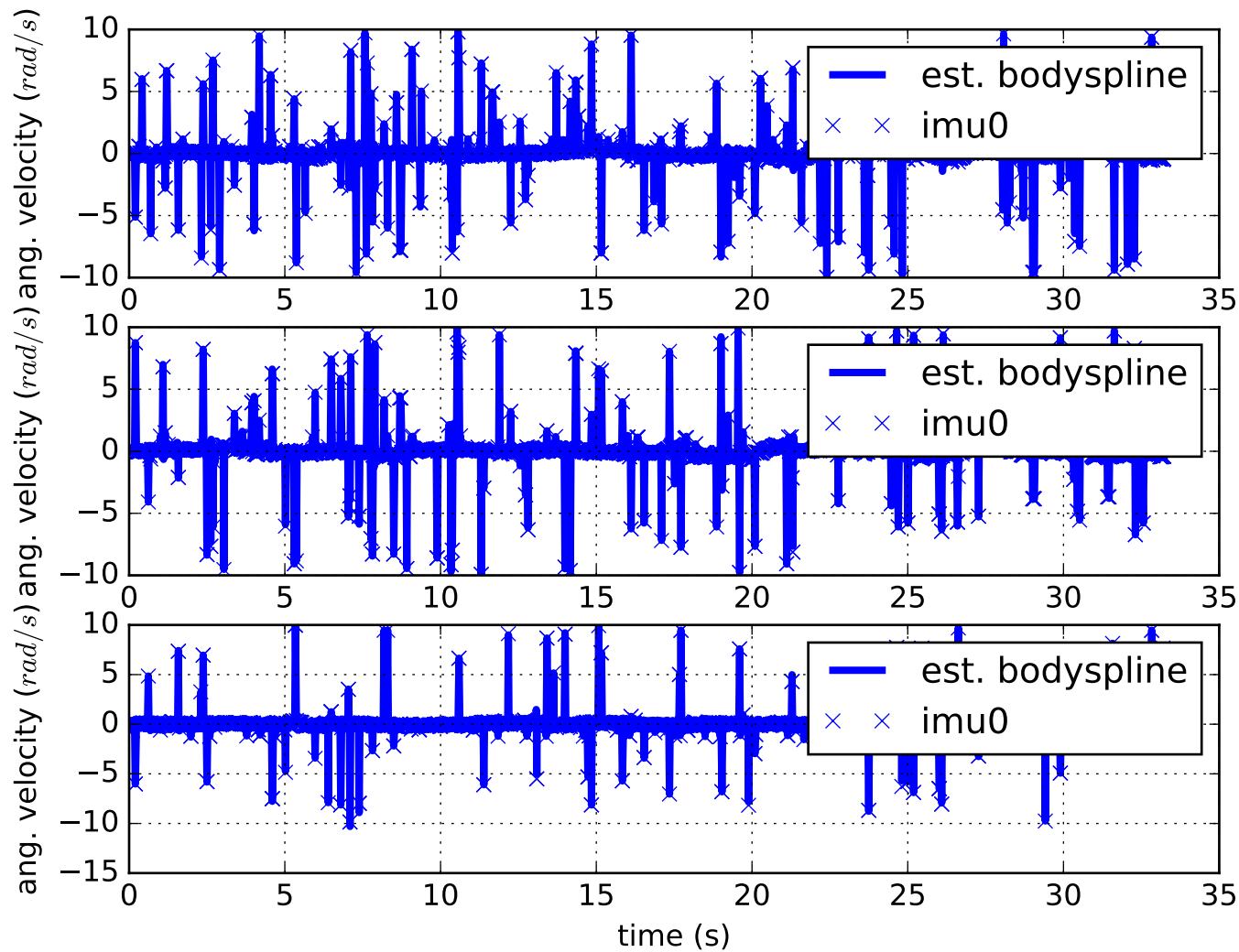
imu0: acceleration error



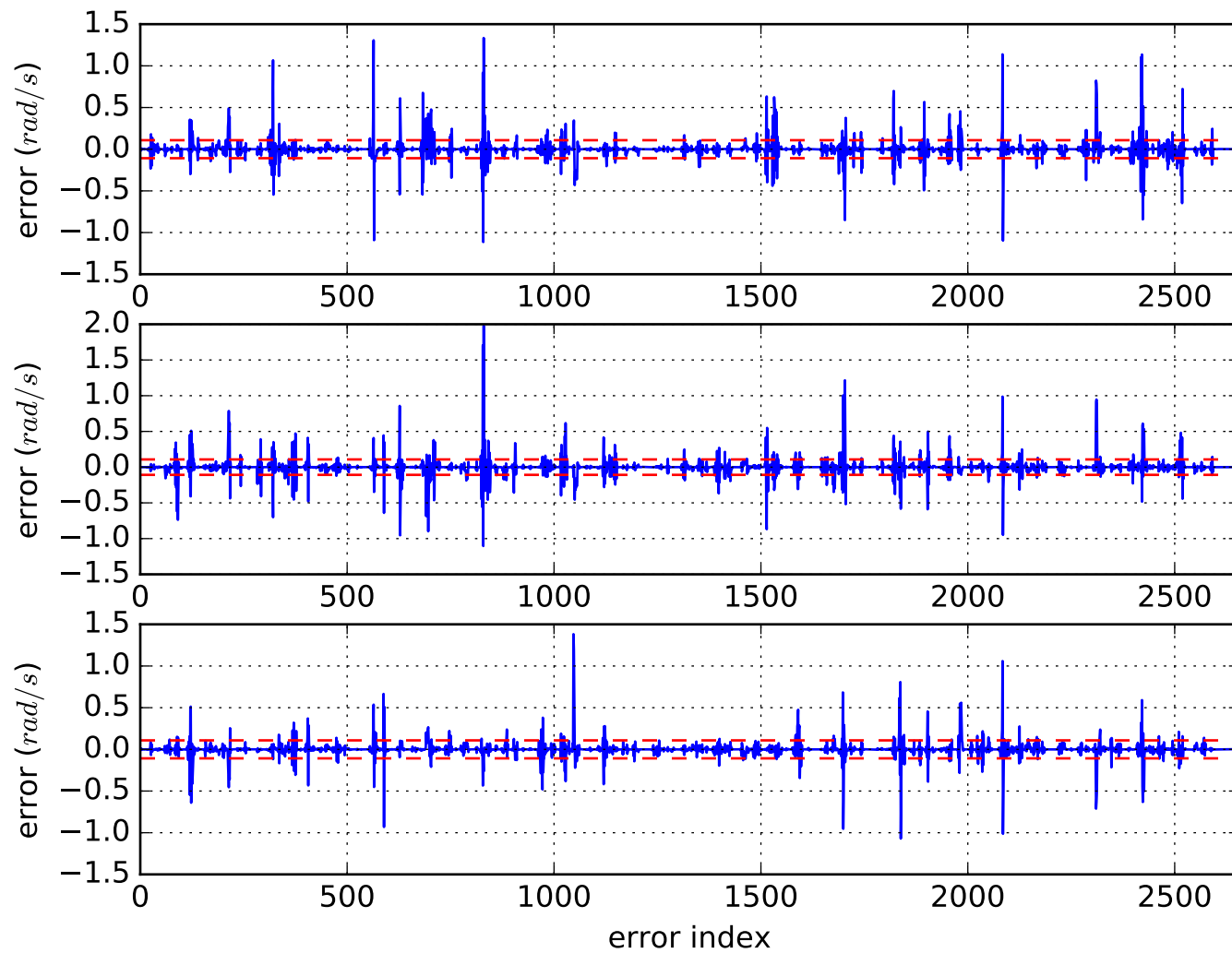
imu0: estimated accelerometer bias (imu frame)



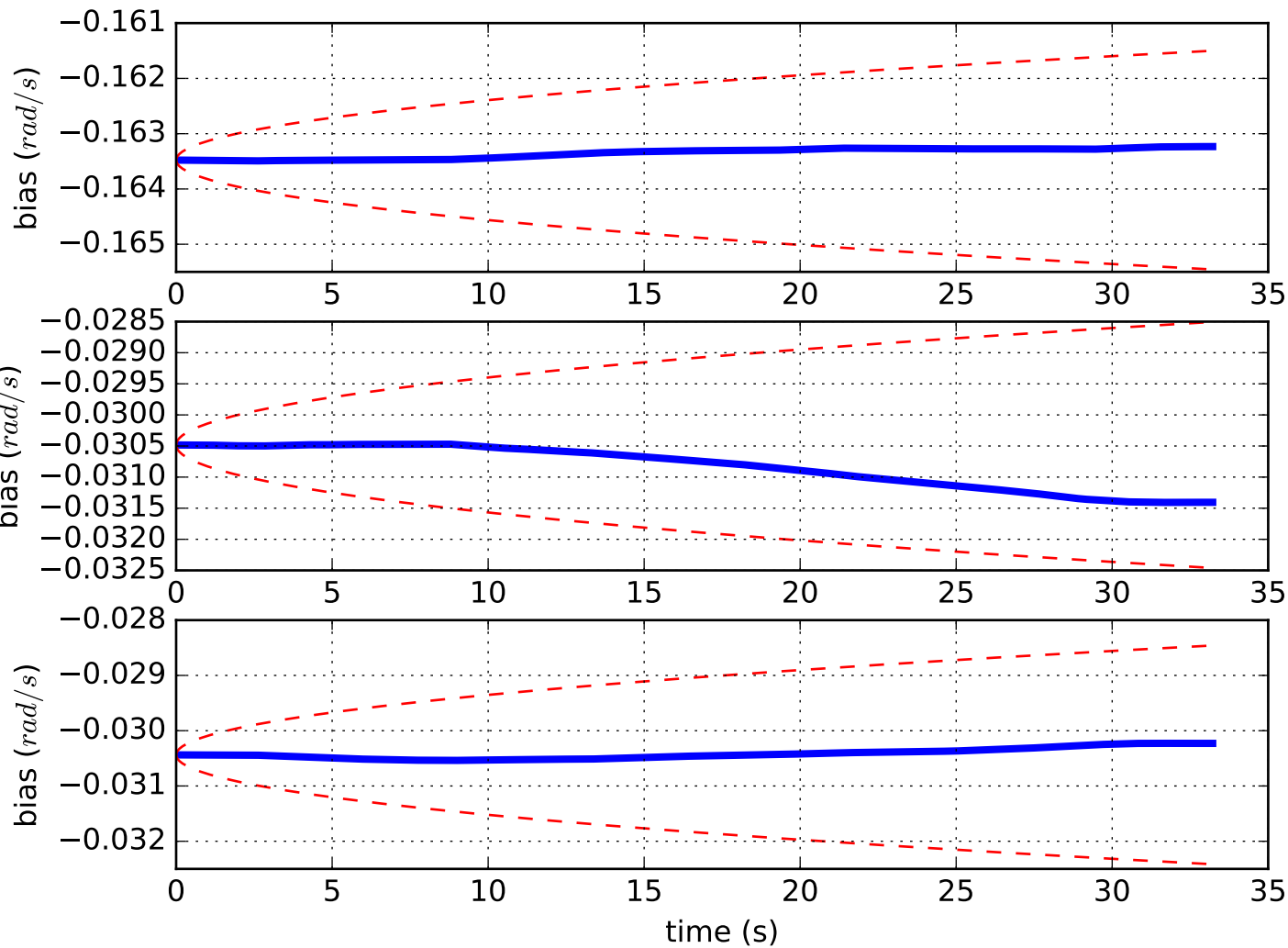
Comparison of predicted and measured angular velocities (body frame)



imu0: angular velocities error



imu0: estimated gyro bias (imu frame)





cam0: reprojection errors

