

Calibration results

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Normalized Residuals

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Reprojection error (cam0): mean 5.48445496569, median 3.22892895489, std: 9.50098486052

Gyroscope error (imu0): mean 129.088239903, median 109.590380843, std: 95.2920502822

Accelerometer error (imu0): mean 59.991487594, median 51.3966989372, std: 41.8427635903

Residuals

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Reprojection error (cam0) [px]: mean 5.48445496569, median 3.22892895489, std: 9.50098486052

Gyroscope error (imu0) [rad/s]: mean 6.79709609119, median 5.77044314664, std: 5.01756955539

Accelerometer error (imu0) [m/s^2]: mean 0.45386349969, median 0.388839926925, std: 0.316559963445

Transformation (cam0):

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T\_ci: (imu0 to cam0):

[ [ 0.99586138 0.07966571 0.04374344 -0.10434033 ]  
[ -0.07682771 0.99504431 -0.06312158 -0.11127042 ]  
[ -0.04855529 0.05949963 0.99704673 -0.55244998 ]  
[ 0. 0. 0. 1. ] ]

T\_ic: (cam0 to imu0):

[ [ 0.99586138 -0.07682771 -0.04855529 0.06853548 ]  
[ 0.07966571 0.99504431 0.05949963 0.15190192 ]  
[ 0.04374344 -0.06312158 0.99704673 0.54835908 ]  
[ 0. 0. 0. 1. ] ]

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

-0.0883079383948

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

[ 0.03203788 -9.80251497 -0.27945804 ]

Calibration configuration

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cam0

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Camera model: pinhole  
Focal length: [657.6283690104826, 874.8200413515597]  
Principal point: [295.29354482420024, 230.72956849302324]  
Distortion model: radtan  
Distortion coefficients: [0.21423558354382966, -0.30586368141414483, -0.00030595444685297177, -0.009906257253676505]  
Type: aprilgrid  
Tags:  
  Rows: 6  
  Cols: 6  
  Size: 0.03 [m]  
  Spacing 0.009 [m]

## IMU configuration

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### IMU0:

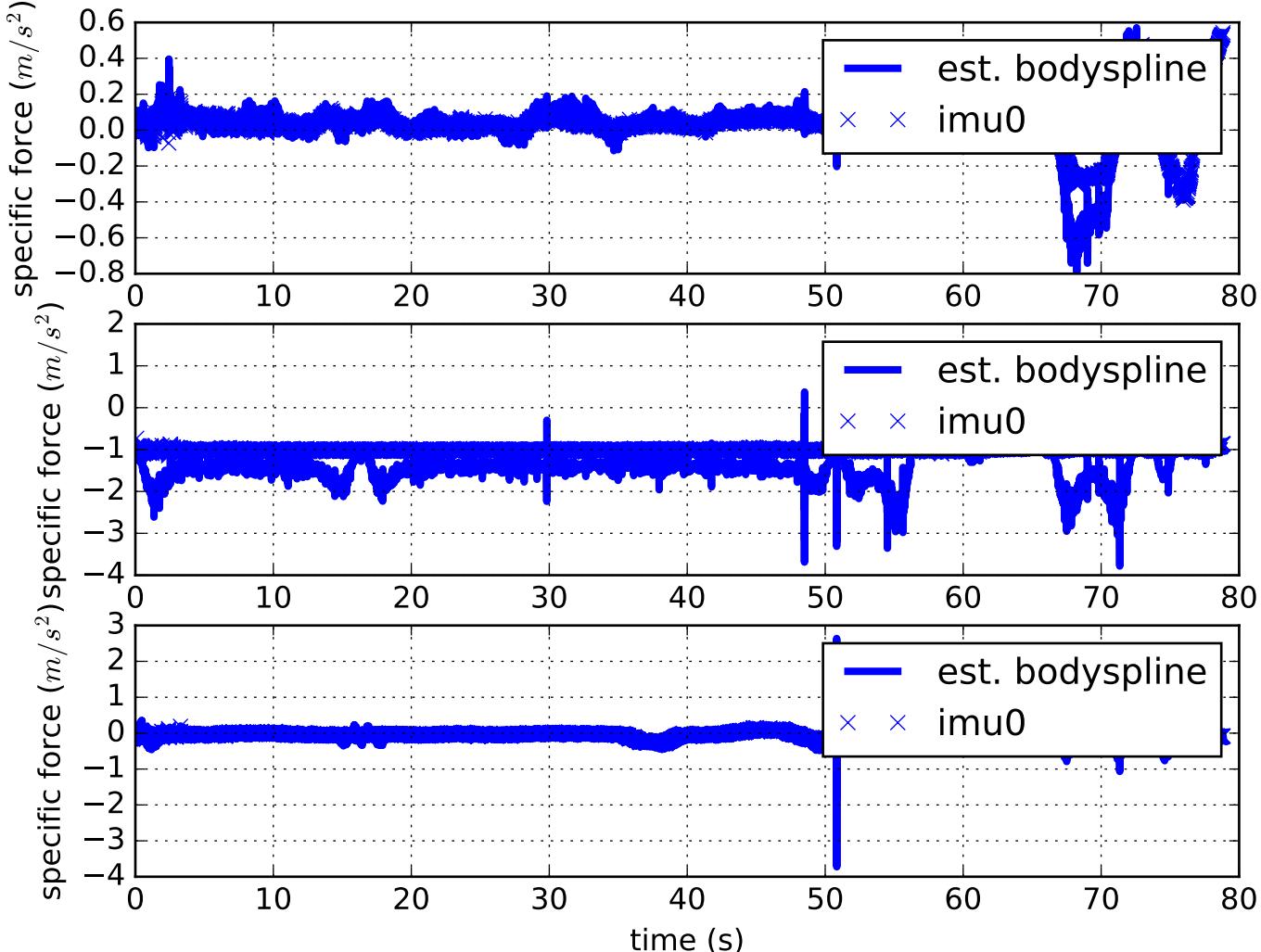
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Model: calibrated  
Update rate: 100.0  
Accelerometer:  
  Noise density: 0.0007565465  
  Noise density (discrete): 0.007565465  
  Random walk: 0.0008532546  
Gyroscope:  
  Noise density: 0.005265465  
  Noise density (discrete): 0.05265465  
  Random walk: 0.045221156

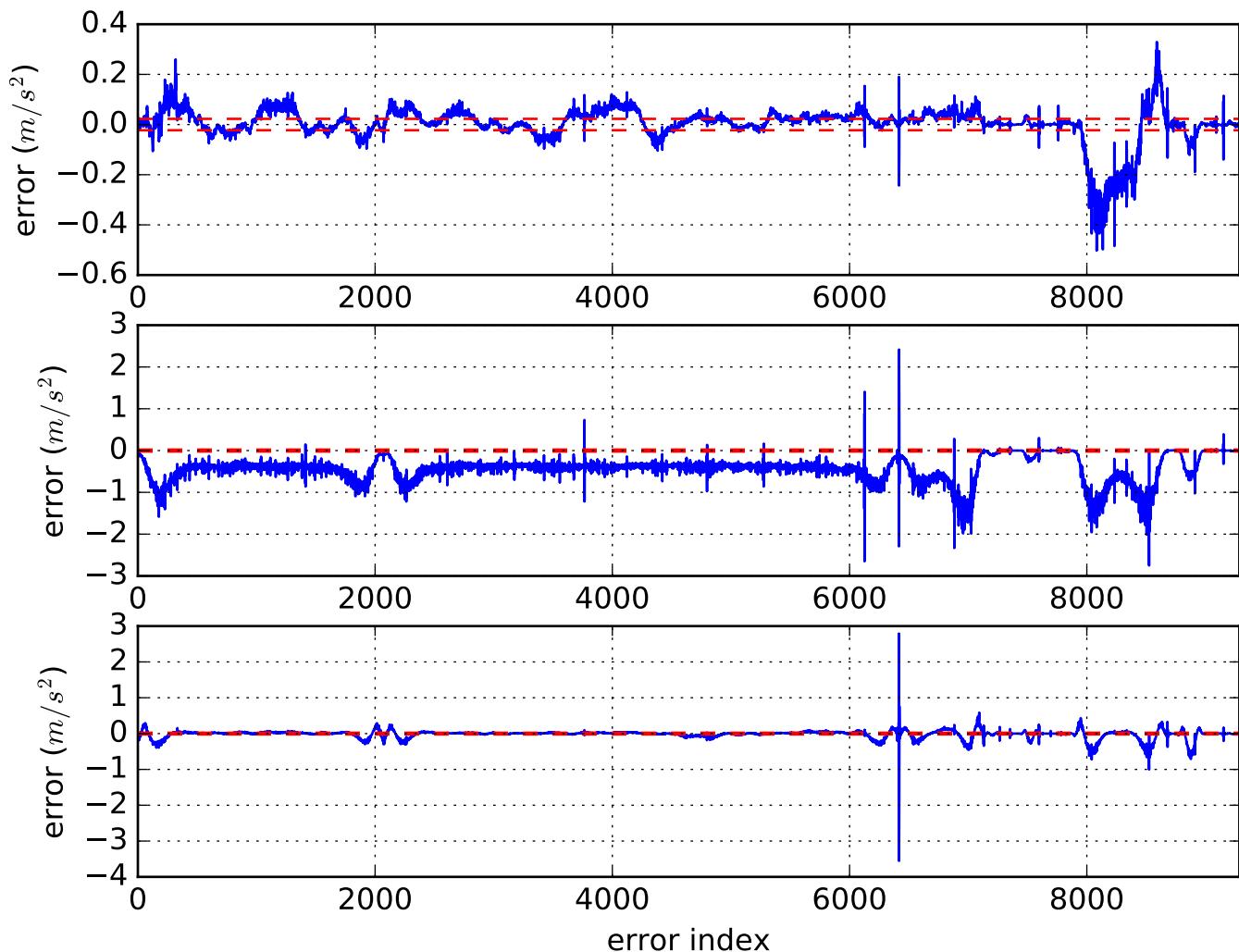
$T_{i,b}$   
[[ 1. 0. 0. 0.]  
 [ 0. 1. 0. 0.]  
 [ 0. 0. 1. 0.]  
 [ 0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

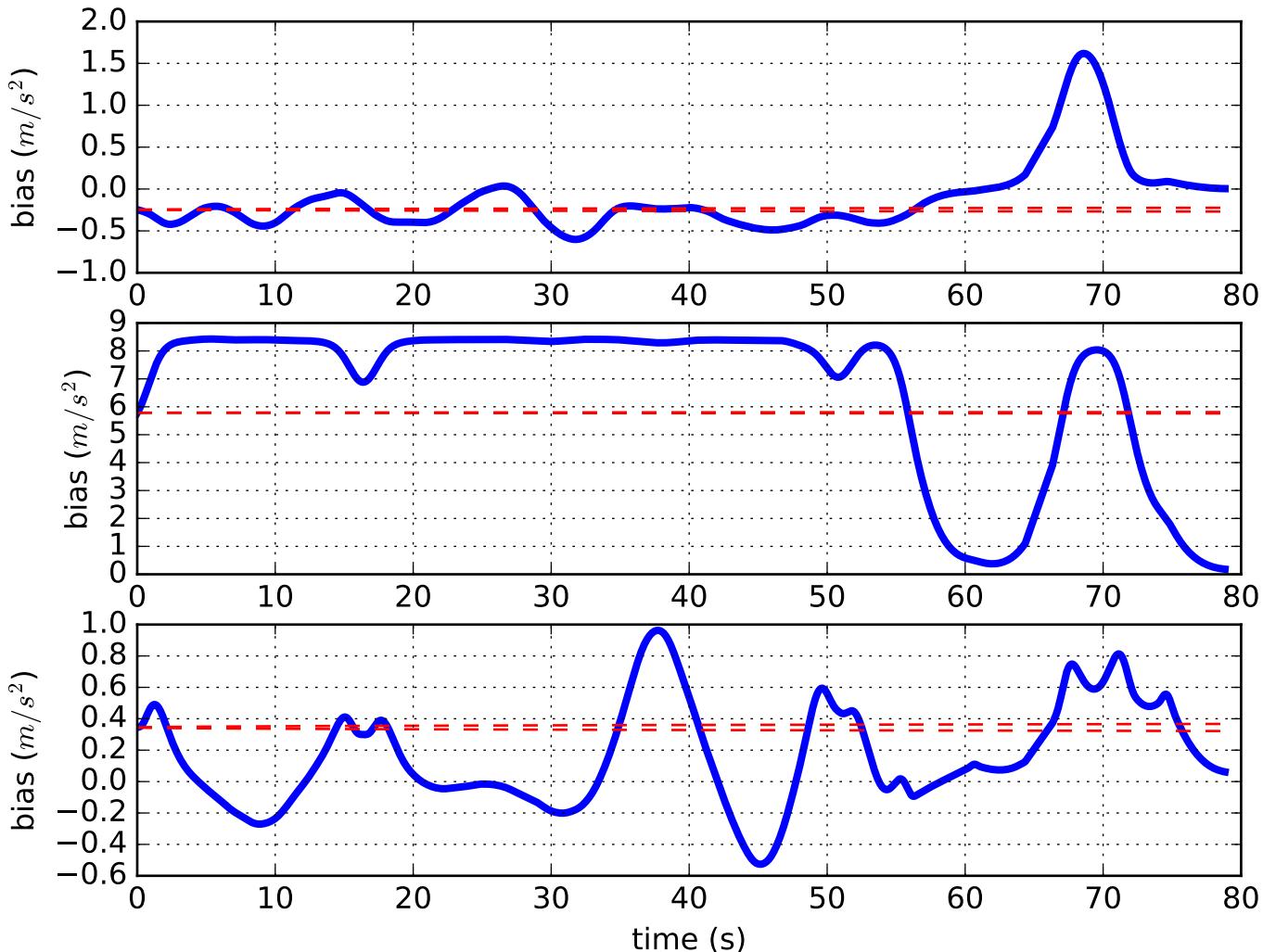
Comparison of predicted and measured specific force (imu0 frame)



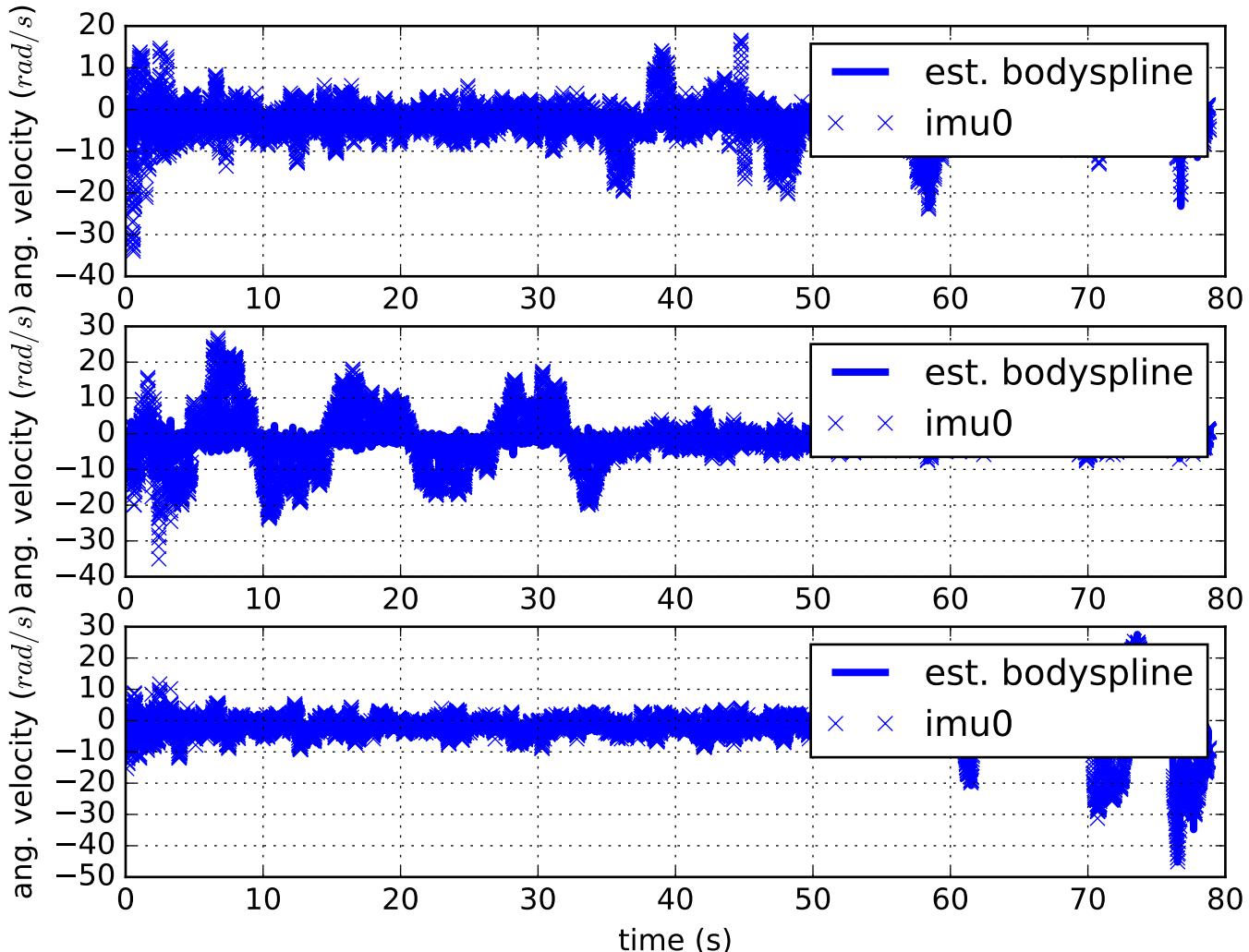
imu0: acceleration error



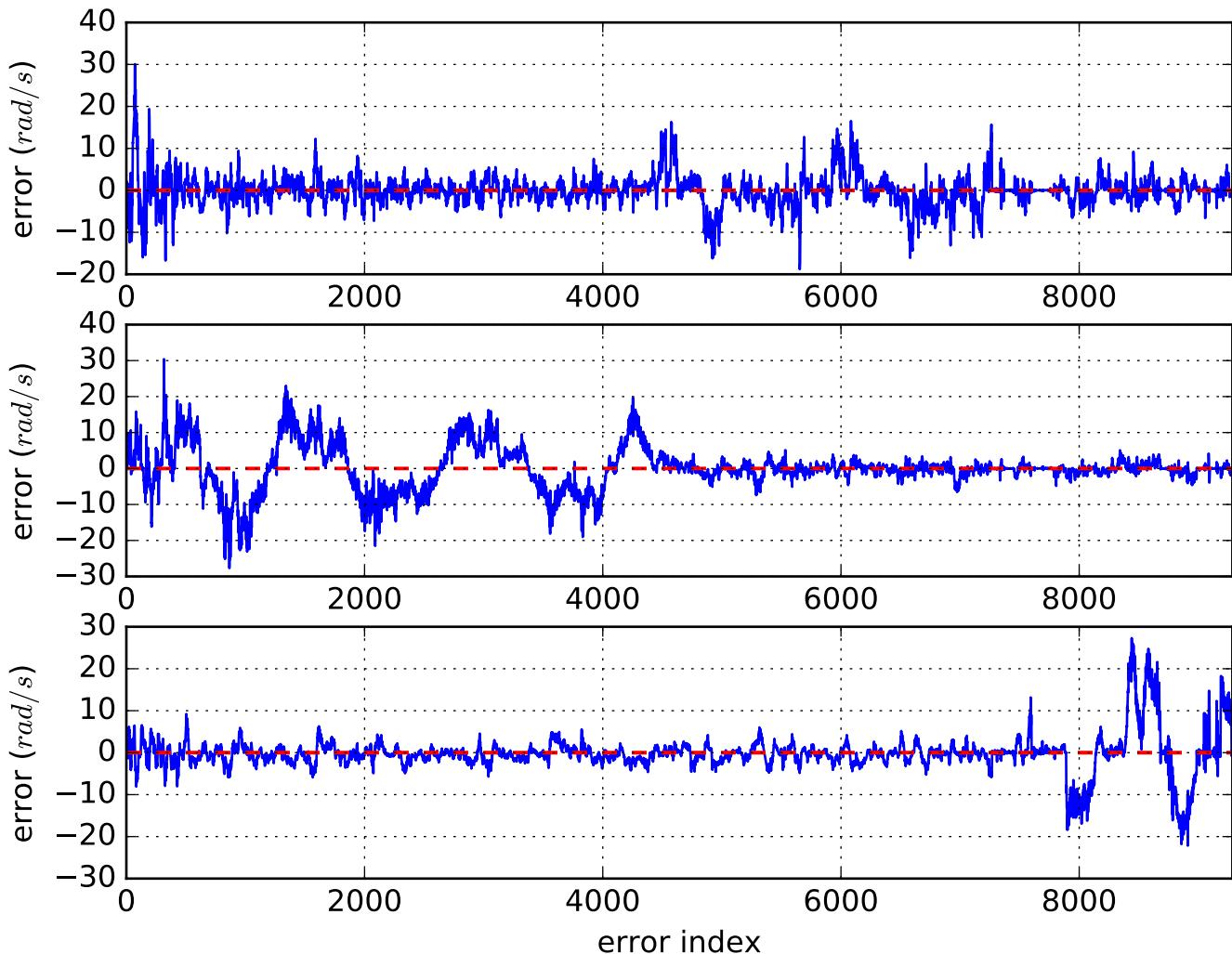
# imu0: estimated accelerometer bias (imu frame)



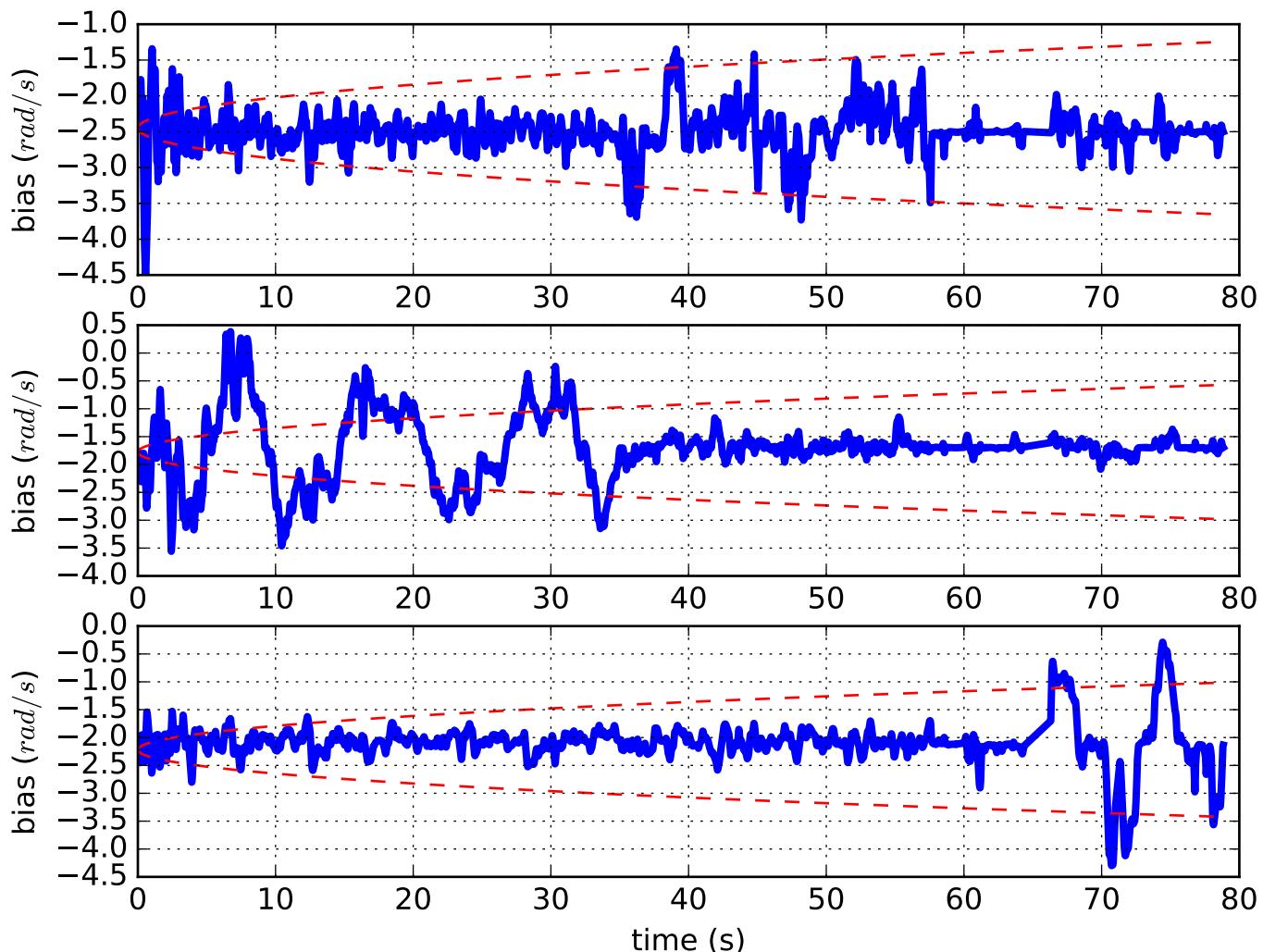
Comparison of predicted and measured angular velocities (body frame)



# imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors

