

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 5.51282337276, median 4.4116265444, std: 4.75018084984

Gyroscope error (imu0): mean 31.2409481554, median 26.4895884189, std: 24.0024019006

Accelerometer error (imu0): mean 8.03924598443, median 6.93723507109, std: 6.33989187206

Residuals

Reprojection error (cam0) [px]: mean 5.51282337276, median 4.4116265444, std: 4.75018084984

Gyroscope error (imu0) [rad/s]: mean 0.999710340972, median 0.847666829404, std: 0.76807686082

Accelerometer error (imu0) [m/s^2]: mean 0.0401962299222, median 0.0346861753554, std: 0.0316994593603

Transformation (cam0):

T_ci: (imu0 to cam0):

[[0.97777592 0.16201106 0.13306638 0.08363687]
[-0.09265597 0.90328126 -0.41892461 0.03960268]
[-0.18806679 0.39728501 0.89821796 0.60799468]
[0. 0. 0. 1.]]

T_ic: (cam0 to imu0):

[[0.97777592 -0.09265597 -0.18806679 0.03623492]
[0.16201106 0.90328126 0.39728501 -0.29086962]
[0.13306638 -0.41892461 0.89821796 -0.54065046]
[0. 0. 0. 1.]]

timeshift cam0 to imu0: [s] (t_imu = t_cam + shift)

-0.14418365615

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

[1.14251748 -8.48113252 -4.78889004]

Calibration configuration

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cam0

Camera model: pinhole
Focal length: [657.6143342957149, 875.0754793394281]
Principal point: [294.6677706487931, 234.9397442208543]
Distortion model: radtan
Distortion coefficients: [0.21286951481655816, -0.3076597497131197, 0.0010928220943022357, -0.009796477352799324]
Type: aprilgrid
Tags:
 Rows: 6
 Cols: 6
 Size: 0.03 [m]
 Spacing 0.009 [m]

IMU configuration

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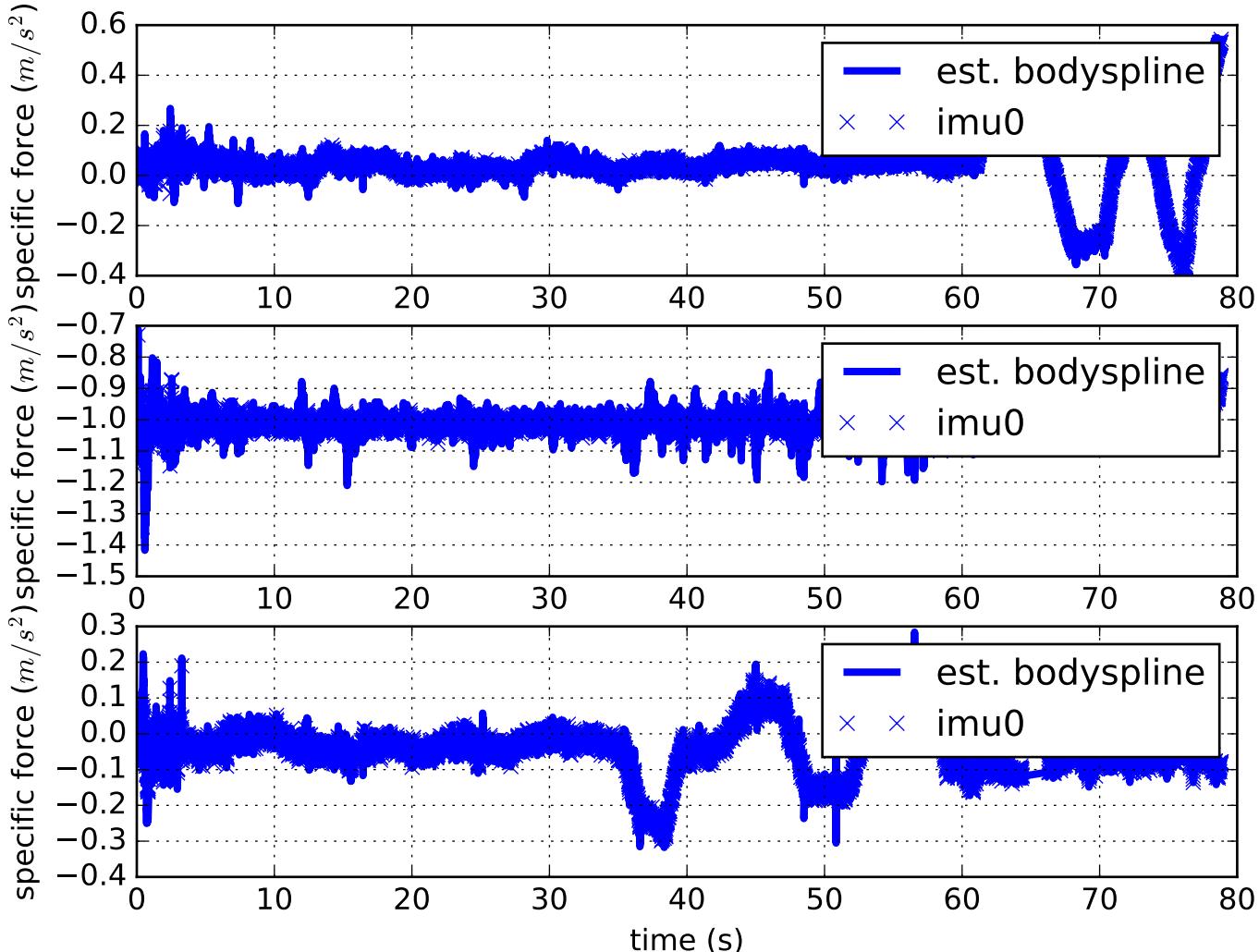
IMU0:

 Model: calibrated
 Update rate: 100.0
 Accelerometer:
 Noise density: 0.0005
 Noise density (discrete): 0.005
 Random walk: 0.0006
 Gyroscope:
 Noise density: 0.0032
 Noise density (discrete): 0.032
 Random walk: 0.0252

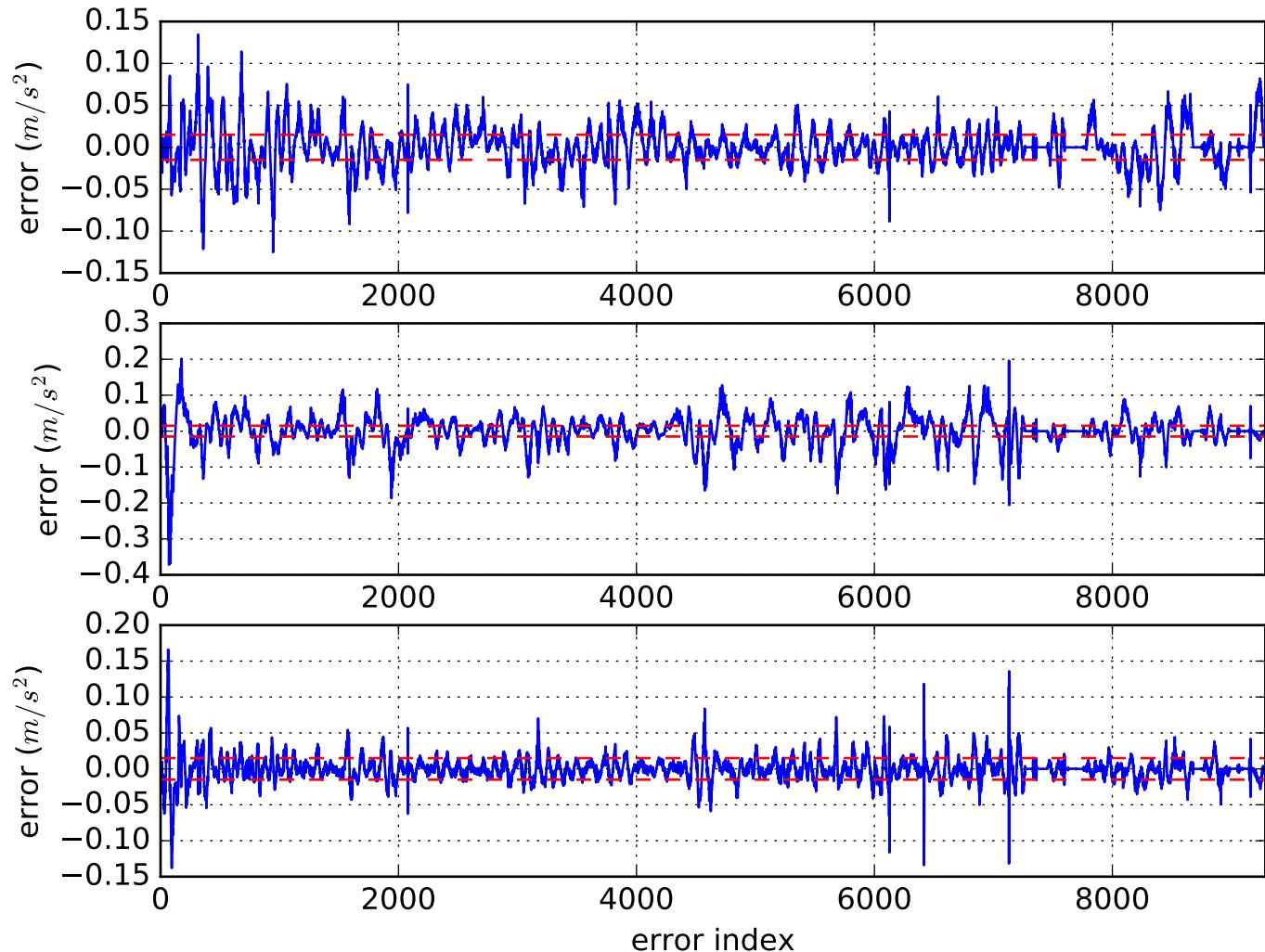
T_i_b
[[1. 0. 0. 0.]
 [0. 1. 0. 0.]
 [0. 0. 1. 0.]
 [0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

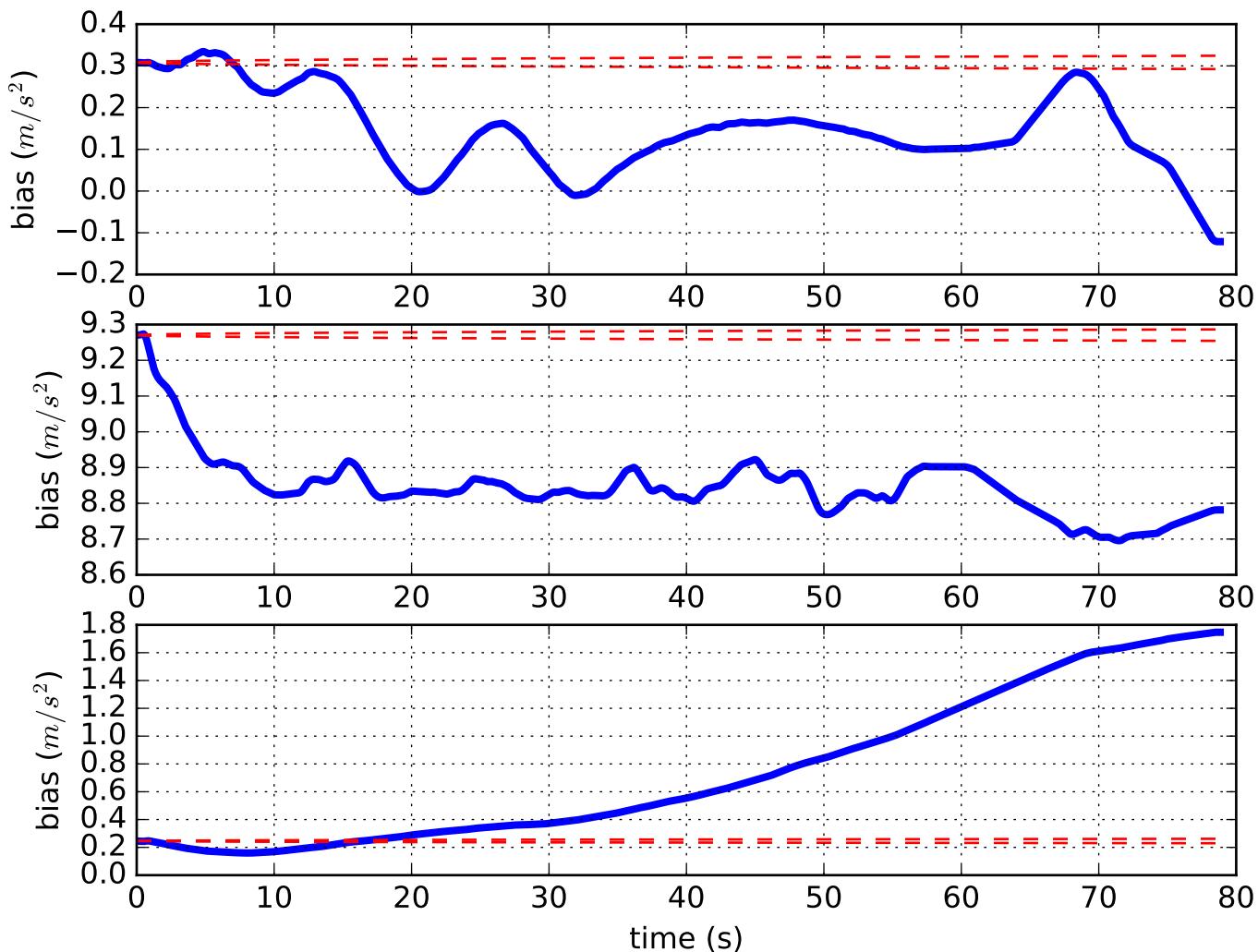
Comparison of predicted and measured specific force (imu0 frame)



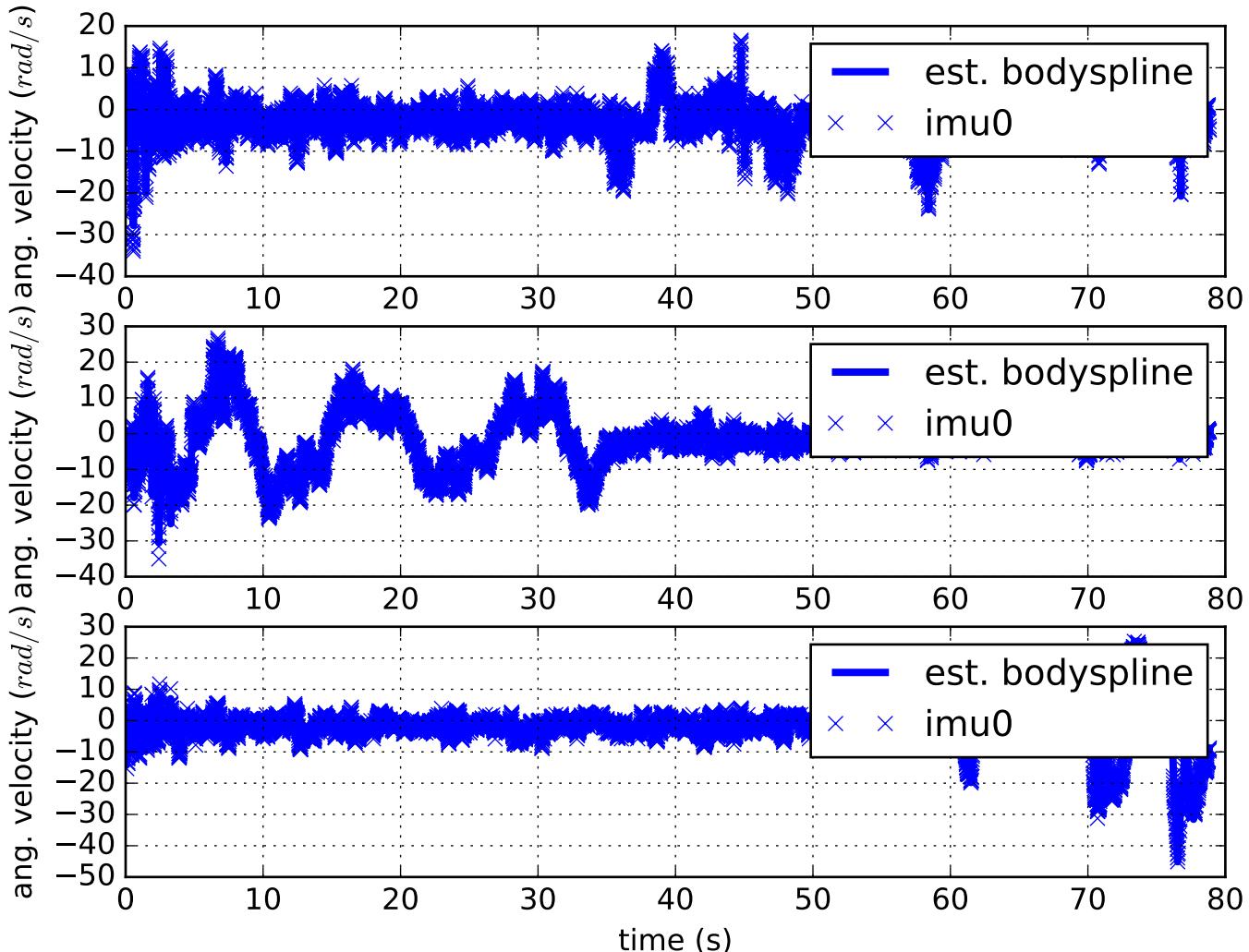
imu0: acceleration error



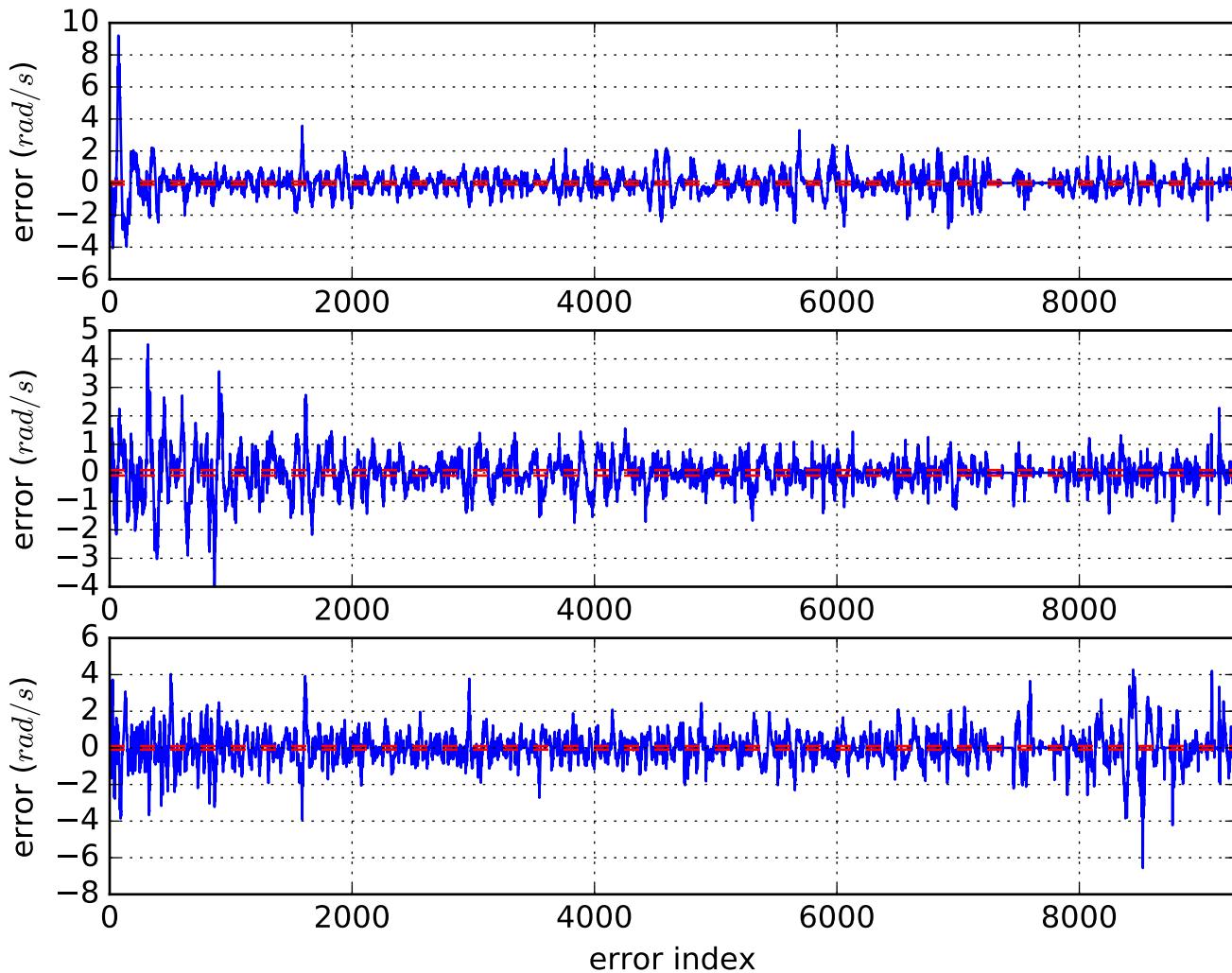
imu0: estimated accelerometer bias (imu frame)



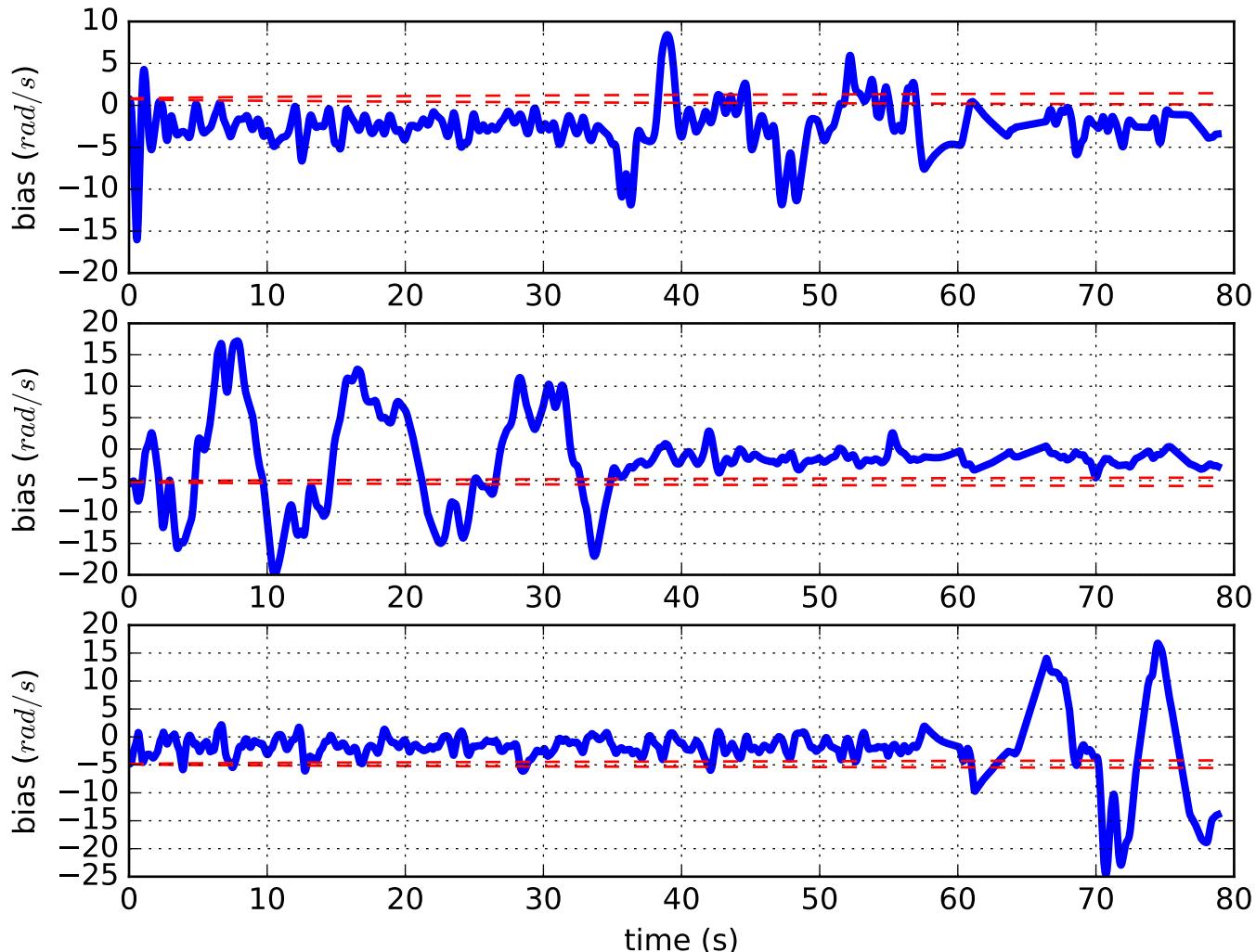
Comparison of predicted and measured angular velocities (body frame)



imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors

