

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 0.143479812017, median 0.124528007095, std: 0.0937268530532
Gyroscope error (imu0): mean 0.410367100765, median 0.372023748986, std: 0.226734790595
Accelerometer error (imu0): mean 0.79678045559, median 0.70481940101, std: 0.494187380097

Residuals

Reprojection error (cam0) [px]: mean 0.143479812017, median 0.124528007095, std: 0.0937268530532
Gyroscope error (imu0) [rad/s]: mean 0.00580346719454, median 0.00526121031341, std: 0.0032065141
Accelerometer error (imu0) [m/s^2]: mean 0.112681772653, median 0.0996765155932, std: 0.0698886495

Transformation (cam0):

T_ci: (imu0 to cam0):
[[-0.99992448 -0.00204915 0.01211724 -0.04731921]
 [0.00199325 -0.99998733 -0.00462343 0.00247454]
 [0.01212656 -0.00459892 0.99991589 0.00365657]
 [0. 0. 0. 1.]]

T_ic: (cam0 to imu0):
[[-0.99992448 0.00199325 0.01212656 -0.04736491]
 [-0.00204915 -0.99998733 -0.00459892 0.00239436]
 [0.01211724 -0.00462343 0.99991589 -0.00307145]
 [0. 0. 0. 1.]]

timeshift cam0 to imu0: [s] (t_imu = t_cam + shift)
0.006665115238443565

Gravity vector in target coords: [m/s^2]
[0.092248 -9.7946604 -0.47385751]

Calibration configuration

Camera model: pinhole

Focal length: [286.31395131598146, 285.9651423229508]

Principal point: [423.87403888477934, 401.82862852539216]

Distortion model: equidistant

Distortion coefficients: [-0.006838977331806387, 0.04411994161557371, -0.04240709819241059, 0.0082

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.083 [m]

Spacing 0.0249 [m]

IMU configuration

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IMU0:

Model: calibrated

Update rate: 200.0

Accelerometer:

Noise density: 0.01

Noise density (discrete): 0.141421356237

Random walk: 0.0001

Gyroscope:

Noise density: 0.001

Noise density (discrete): 0.0141421356237

Random walk: 1e-05

T_i_b

[[1. 0. 0. 0.]

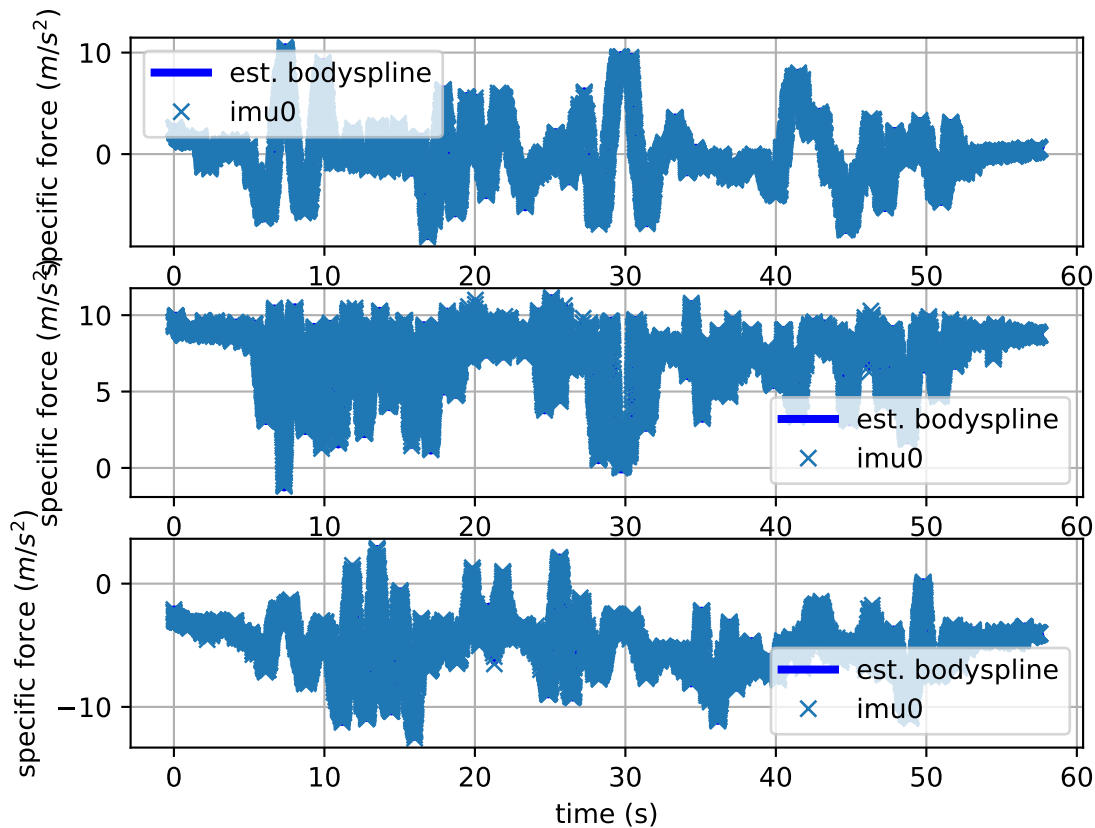
[0. 1. 0. 0.]

[0. 0. 1. 0.]

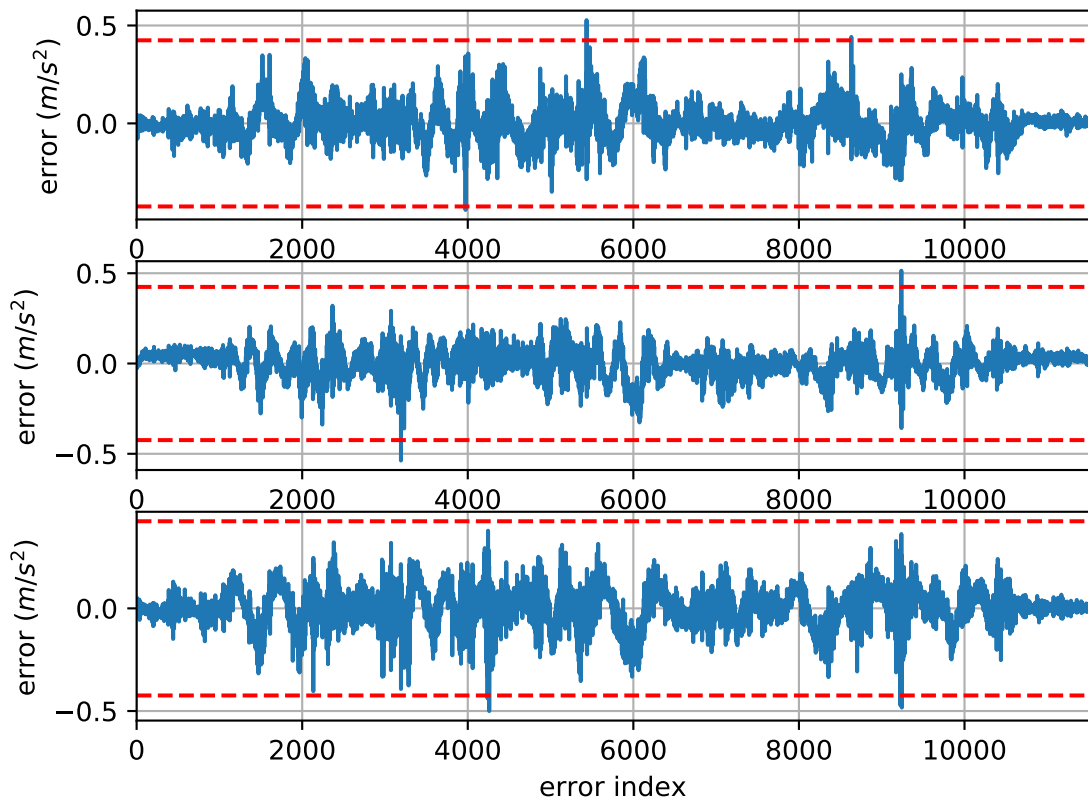
[0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

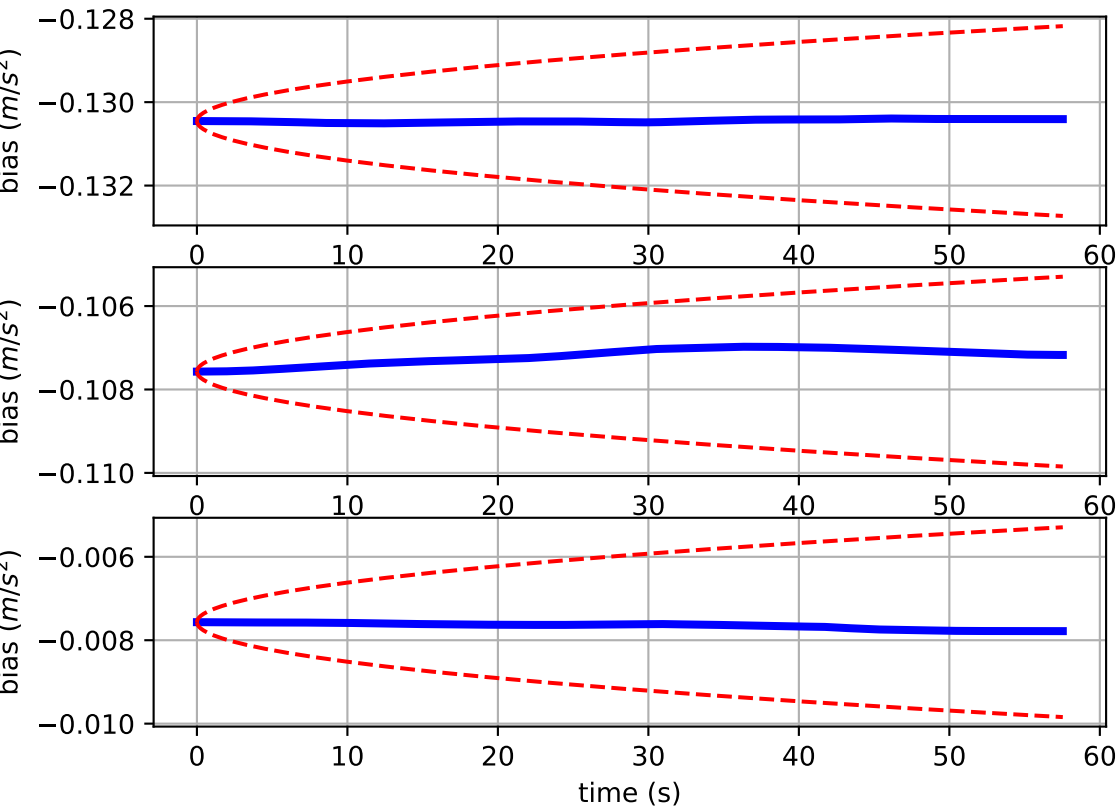
Comparison of predicted and measured specific force (imu0 frame)



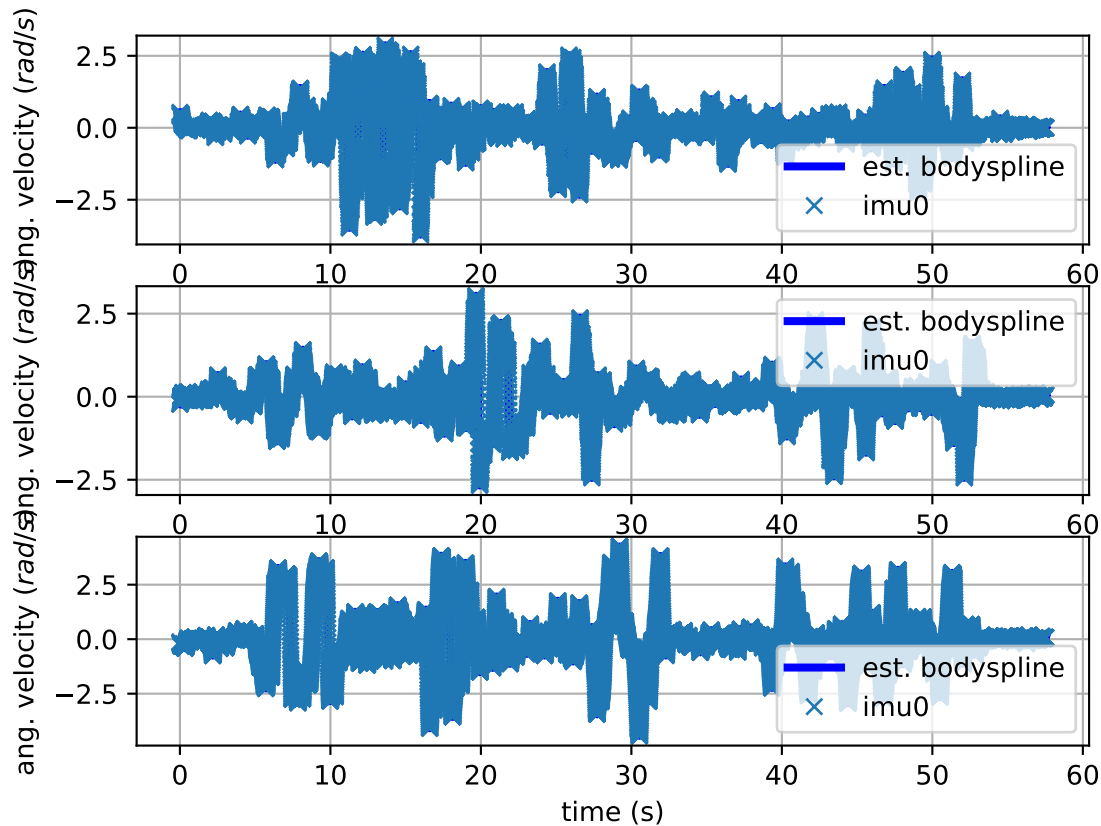
imu0: acceleration error



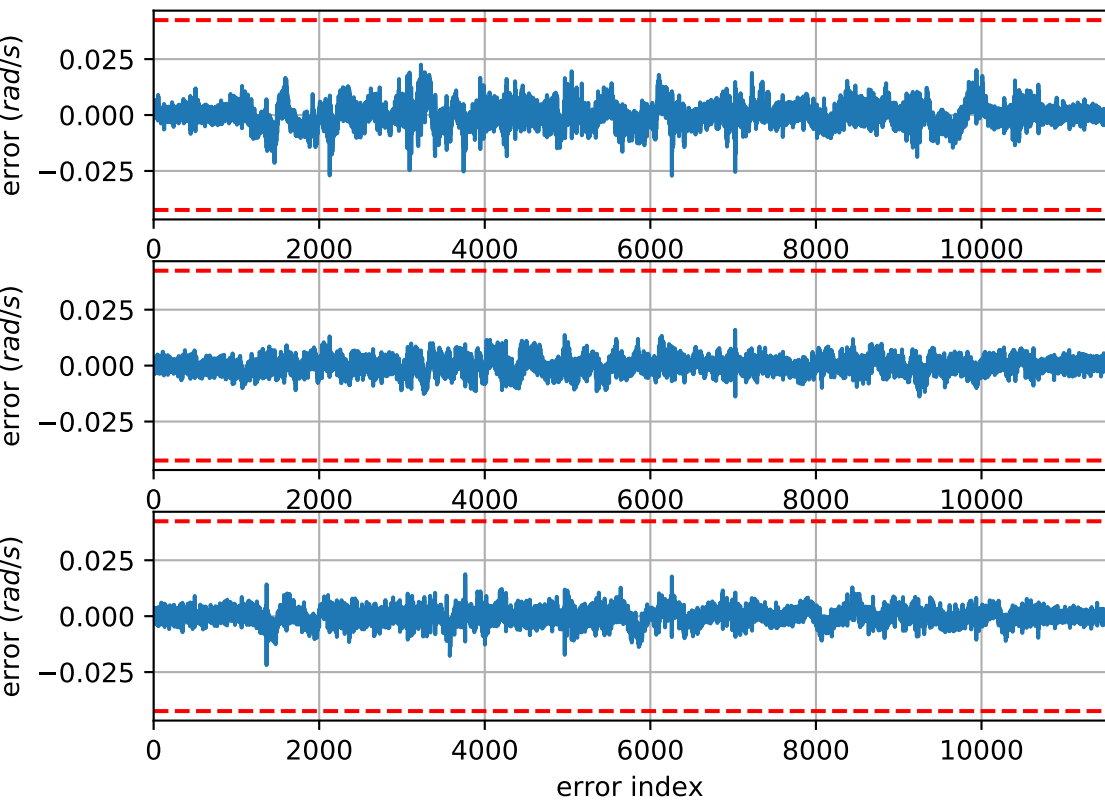
imu0: estimated accelerometer bias (imu frame)



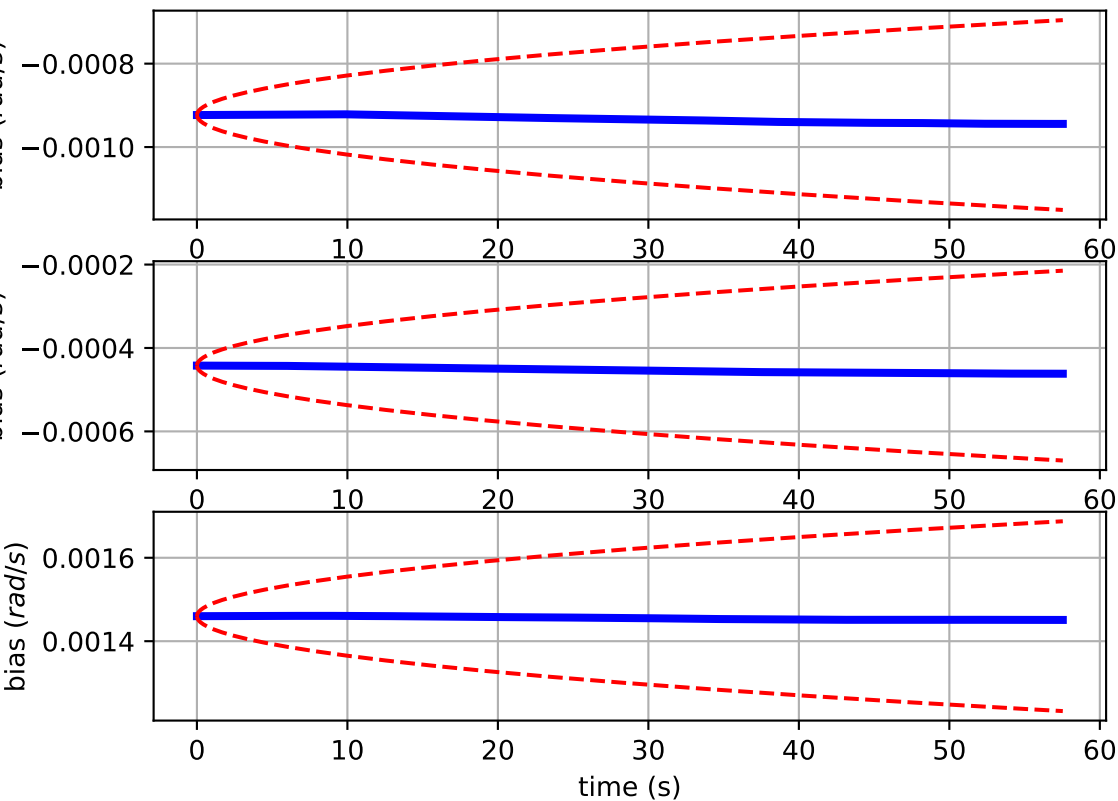
Comparison of predicted and measured angular velocities (body frame)



imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors

