

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 2.048663321820151, median 1.9208254840587482, std: 1.0375251429776893
Gyroscope error (imu0): mean 2.635315040027542, median 2.174619016089148, std: 1.7987720254302872
Accelerometer error (imu0): mean 8.99616606095733, median 7.88311474975253, std: 6.012748743914562

Residuals

Reprojection error (cam0) [px]: mean 2.048663321820151, median 1.9208254840587482, std: 1.0375251429776893
Gyroscope error (imu0) [rad/s]: mean 0.007112465892234019, median 0.005869090922949357, std: 0.004854715464547993
Accelerometer error (imu0) [m/s²]: mean 0.179704491543612, median 0.1574705400373051, std: 0.12010871614453884

Transformation (cam0):

T_ci: (imu0 to cam0):

[[0.99986795 0.01410533 -0.00806978 0.01233316]
[-0.01376943 0.99909414 0.04026543 -0.07556576]
[0.00863042 -0.040149 0.99915643 0.0563365]
[0. 0. 0. 1.]]

T_ic: (cam0 to imu0):

[[0.99986795 -0.01376943 0.00863042 -0.01385824]
[0.01410533 0.99909414 -0.040149 0.0775852]
[-0.00806978 0.04026543 0.99915643 -0.05314676]
[0. 0. 0. 1.]]

timeshift cam0 to imu0: [s] (t_imu = t_cam + shift)
-0.03837391937429866

Gravity vector in target coords: [m/s²]

[-0.02845486 -9.80142023 -0.31587128]

Calibration configuration

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cam0

Camera model: pinhole

Focal length: [594.0161425224795, 592.2078722177328]

Principal point: [326.47631006757166, 240.74268467266444]

Distortion model: radtan

Distortion coefficients: [0.13493546677940987, -0.23752125457099688, 0.0005042661285656044, 0.001171106451235085]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.003 [m]

Spacing 0.001101 [m]

IMU configuration

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IMU0:

Model: calibrated

Update rate: 200.0

Accelerometer:

Noise density: 0.001412493541350285

Noise density (discrete): 0.019975675229419752

Random walk: 0.0002126313815515883

Gyroscope:

Noise density: 0.00019084142832896903

Noise density (discrete): 0.00269890536205481

Random walk: 1.299081499255472e-05

T_ib (imu0 to imu0)

[[1. 0. 0. 0.]

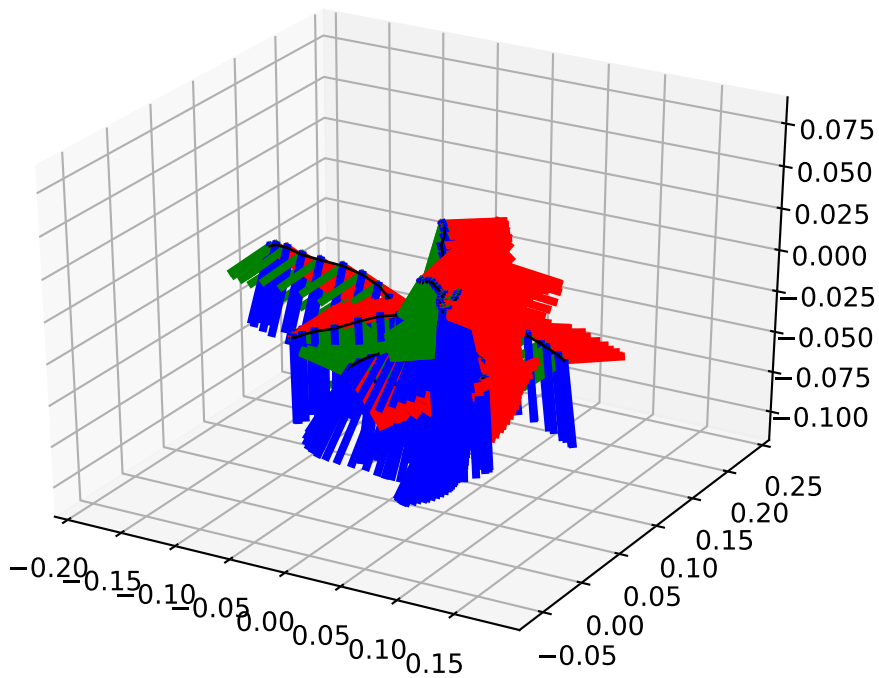
[0. 1. 0. 0.]

[0. 0. 1. 0.]

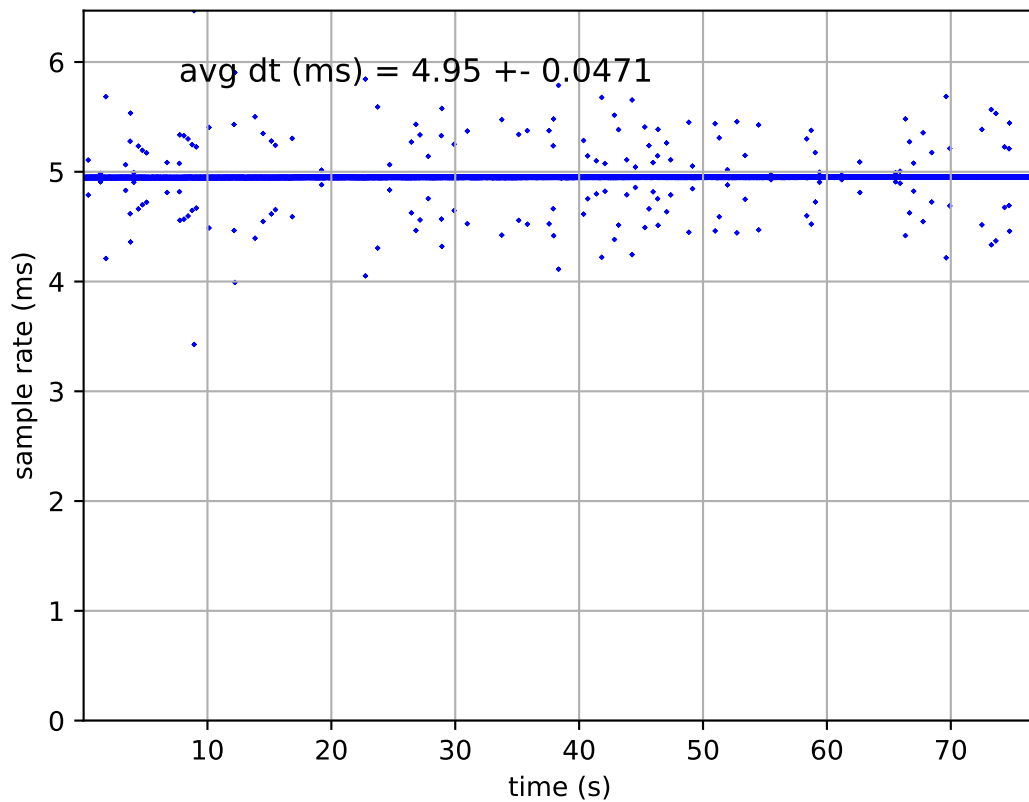
[0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

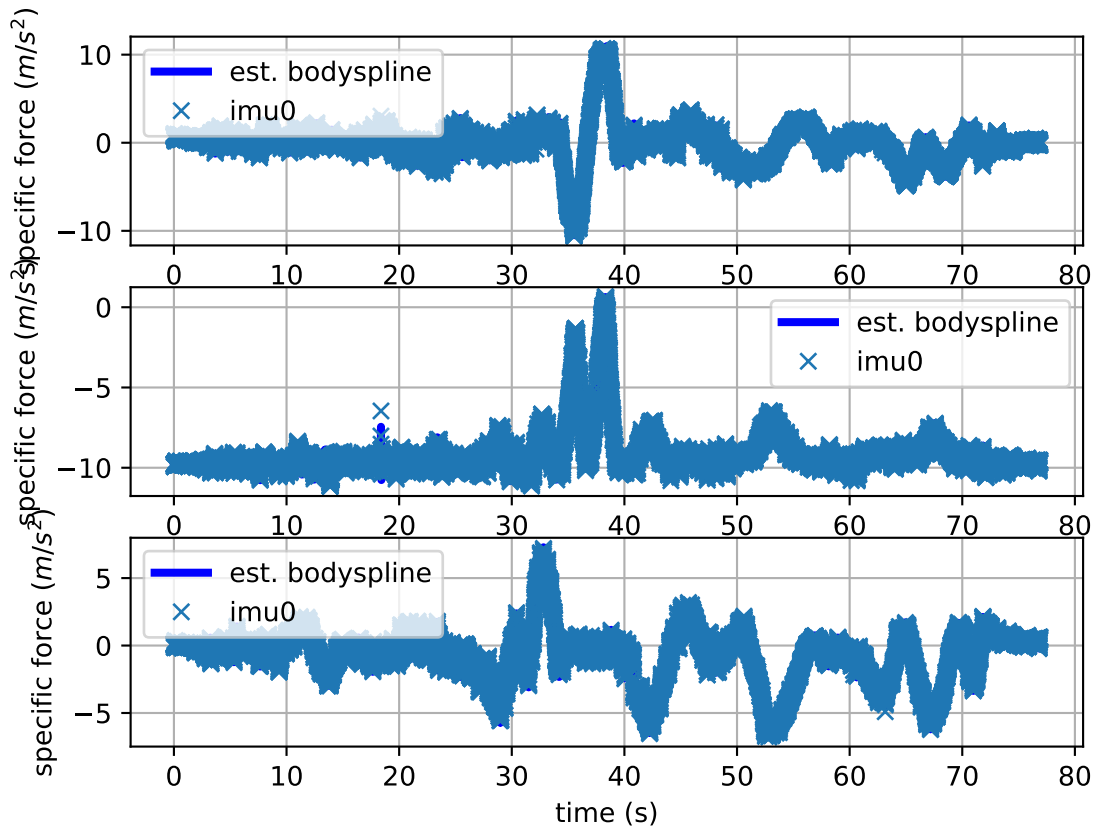
imu0: estimated poses



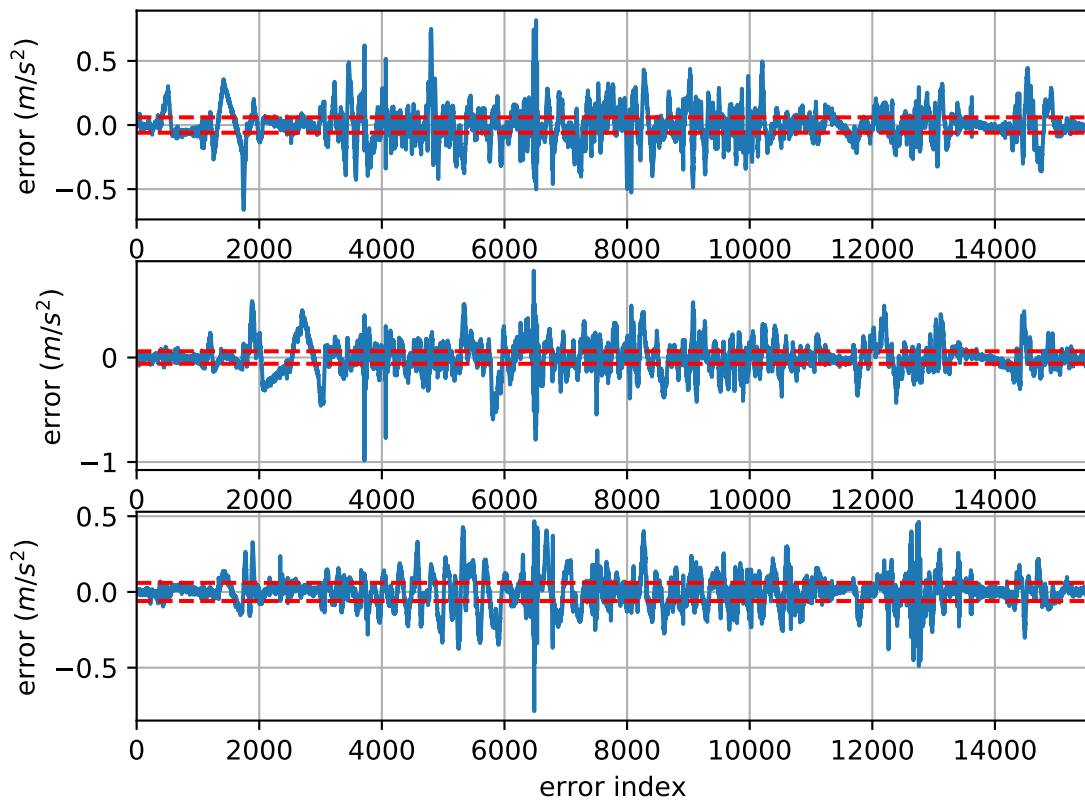
imu0: sample inertial rate



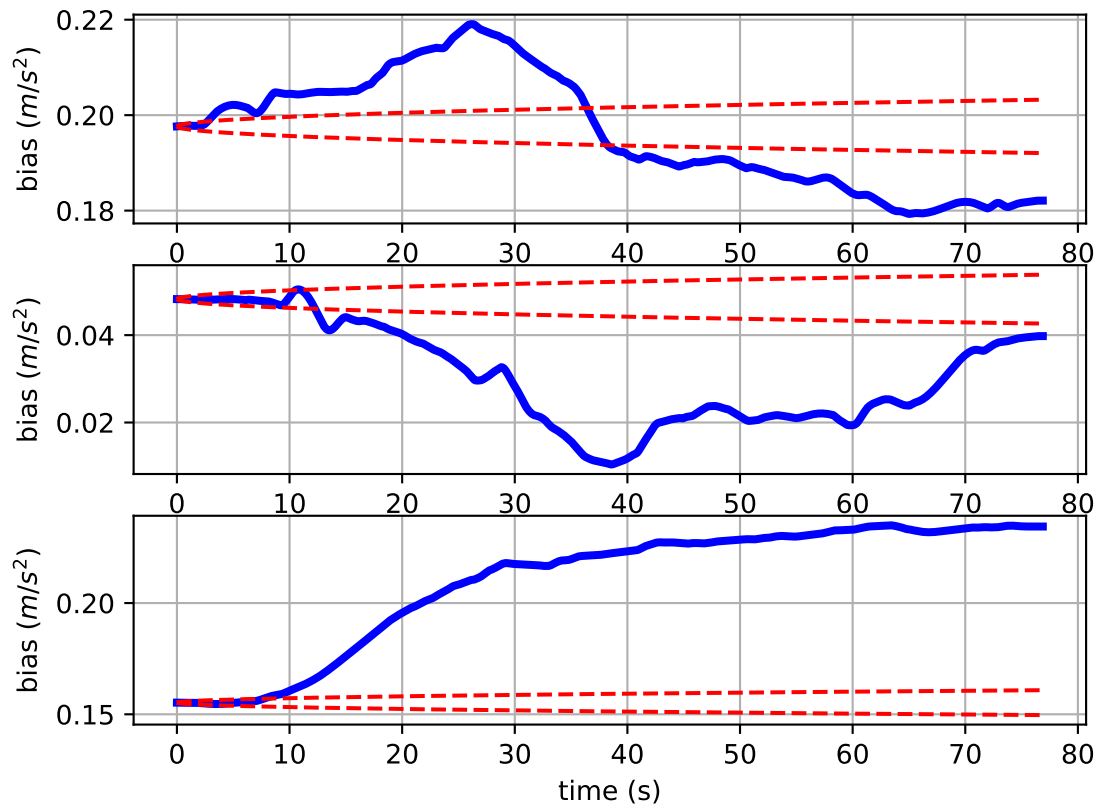
Comparison of predicted and measured specific force (imu0 frame)



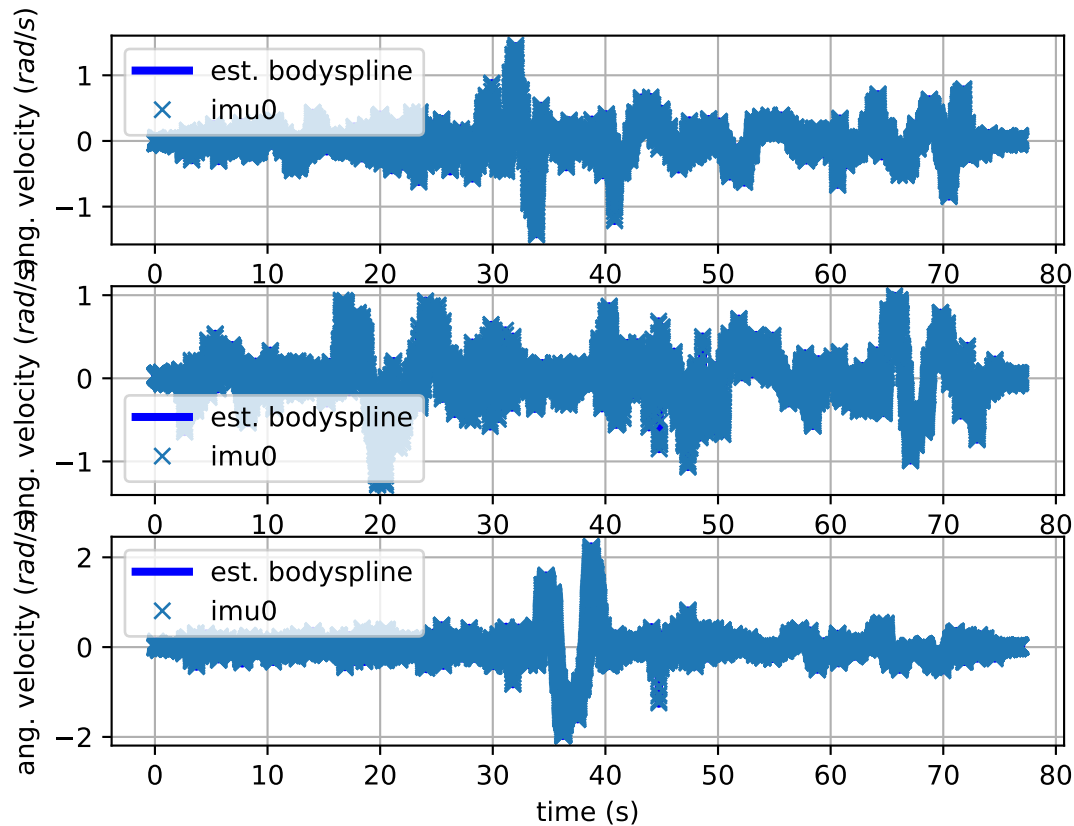
imu0: acceleration error



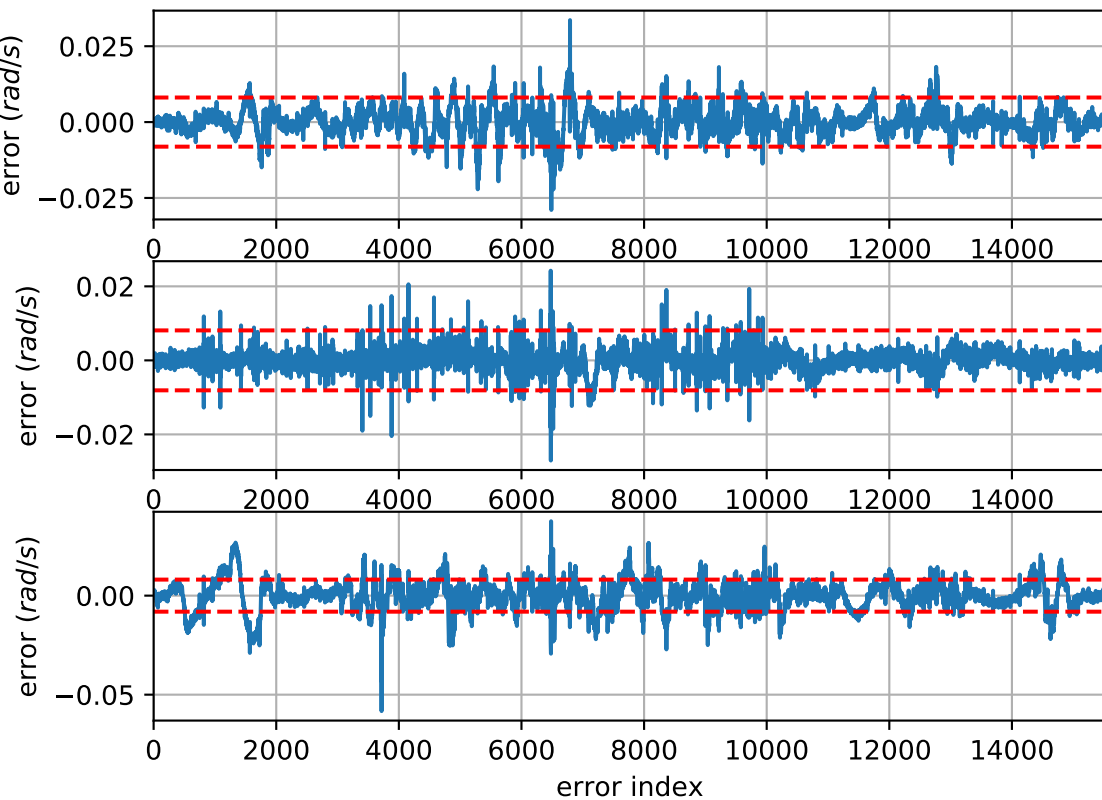
imu0: estimated accelerometer bias (imu frame)



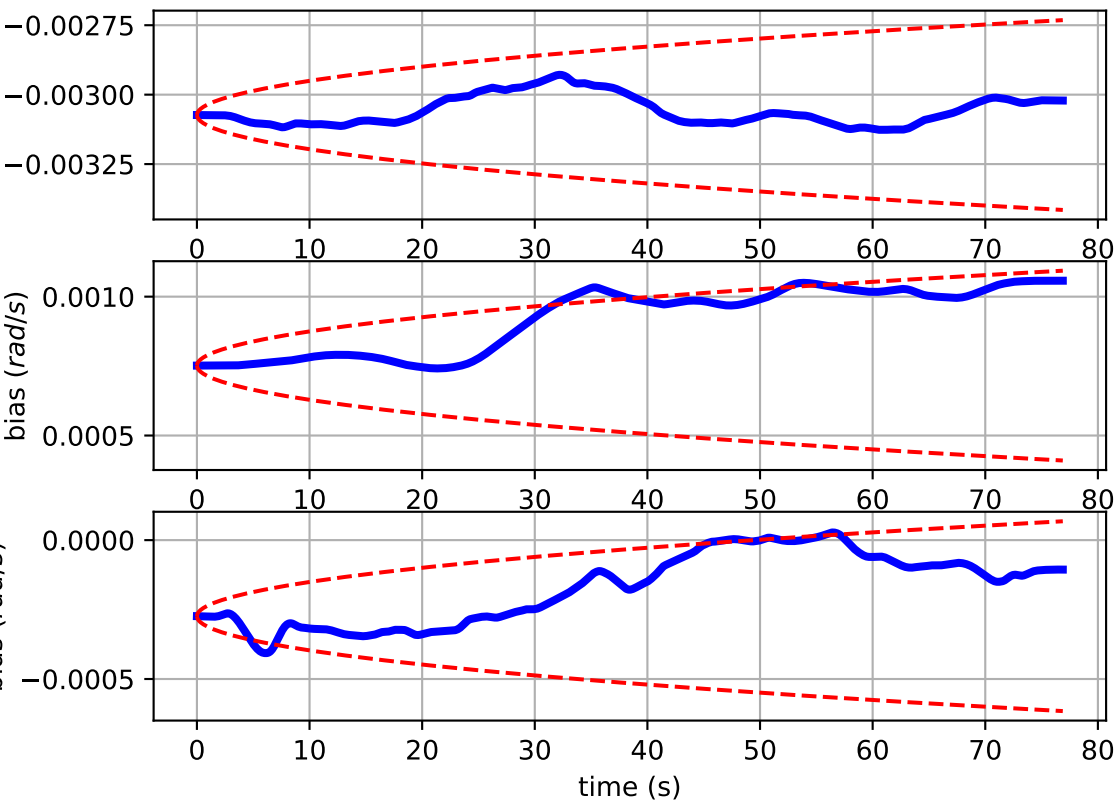
Comparison of predicted and measured angular velocities (body frame)



imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors

