

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 0.18396789520448853, median 0.1696936294608972, std: 0.101064170154015
Gyroscope error (imu0): mean 0.7200648539399104, median 0.6490982816033304, std: 0.46219048647911753
Accelerometer error (imu0): mean 1.6035684769699465, median 1.4042228369509326, std: 0.9670936649816345

Residuals

Reprojection error (cam0) [px]: mean 0.18396789520448853, median 0.1696936294608972, std: 0.101064170154015
Gyroscope error (imu0) [rad/s]: mean 0.0018329858680140412, median 0.0016523344676817008, std: 0.0011765448978814559
Accelerometer error (imu0) [m/s^2]: mean 0.04535576576649733, median 0.03971741961220064, std: 0.027353539542042594

Transformation (cam0):

T_ci: (imu0 to cam0):
[[-0.99994855 -0.00239408 -0.00985722 -0.00101459]
[-0.00245383 0.99997866 0.00605393 0.00039527]
[0.00984252 0.00607781 -0.99993309 -0.05617698]
[0. 0. 0. 1.]]

T_ic: (cam0 to imu0):
[[-0.99994855 -0.00245383 0.00984252 -0.00046065]
[-0.00239408 0.99997866 0.00607781 -0.00005625]
[-0.00985722 0.00605393 -0.99993309 -0.05618562]
[0. 0. 0. 1.]]

timeshift cam0 to imu0: [s] ($t_{imu} = t_{cam} + \text{shift}$)
0.019081827388163747

Gravity vector in target coords: [m/s^2]
[0.03283453 -9.79860586 -0.3932786]

Calibration configuration

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cam0

Camera model: pinhole

Focal length: [249.30868162412247, 249.19232446043537]

Principal point: [171.59846039823438, 138.9509595096669]

Distortion model: equidistant

Distortion coefficients: [-0.08905470757236078, 0.09964706092126333, -0.237200391952188, 0.19913316990563784]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.029 [m]

Spacing 0.0087 [m]

IMU configuration

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IMU0:

Model: calibrated

Update rate: 200

Accelerometer:

Noise density: 0.002

Noise density (discrete): 0.0282842712474619

Random walk: 4e-05

Gyroscope:

Noise density: 0.00018

Noise density (discrete): 0.002545584412271571

Random walk: 0.001

T_ib (imu0 to imu0)

[[1. 0. 0. 0.]

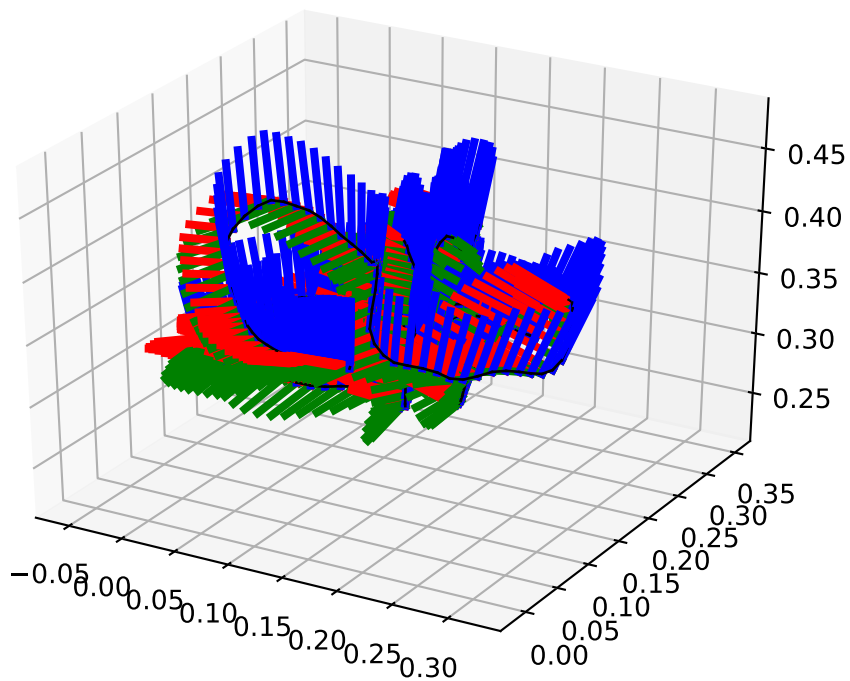
[0. 1. 0. 0.]

[0. 0. 1. 0.]

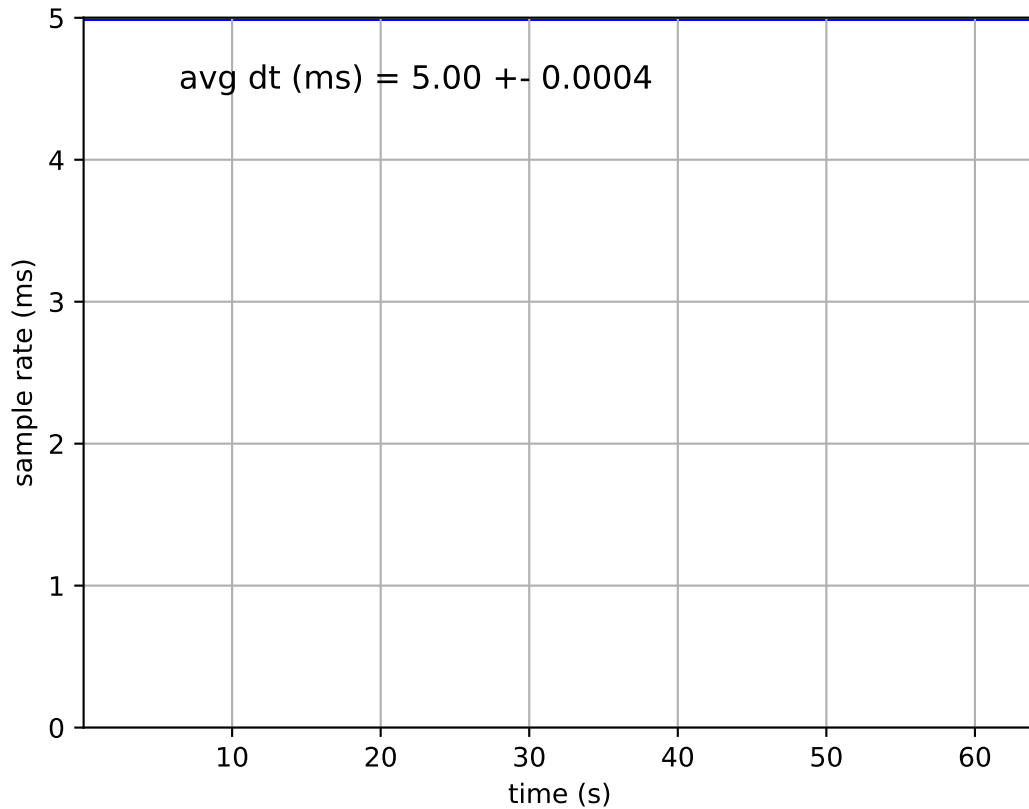
[0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

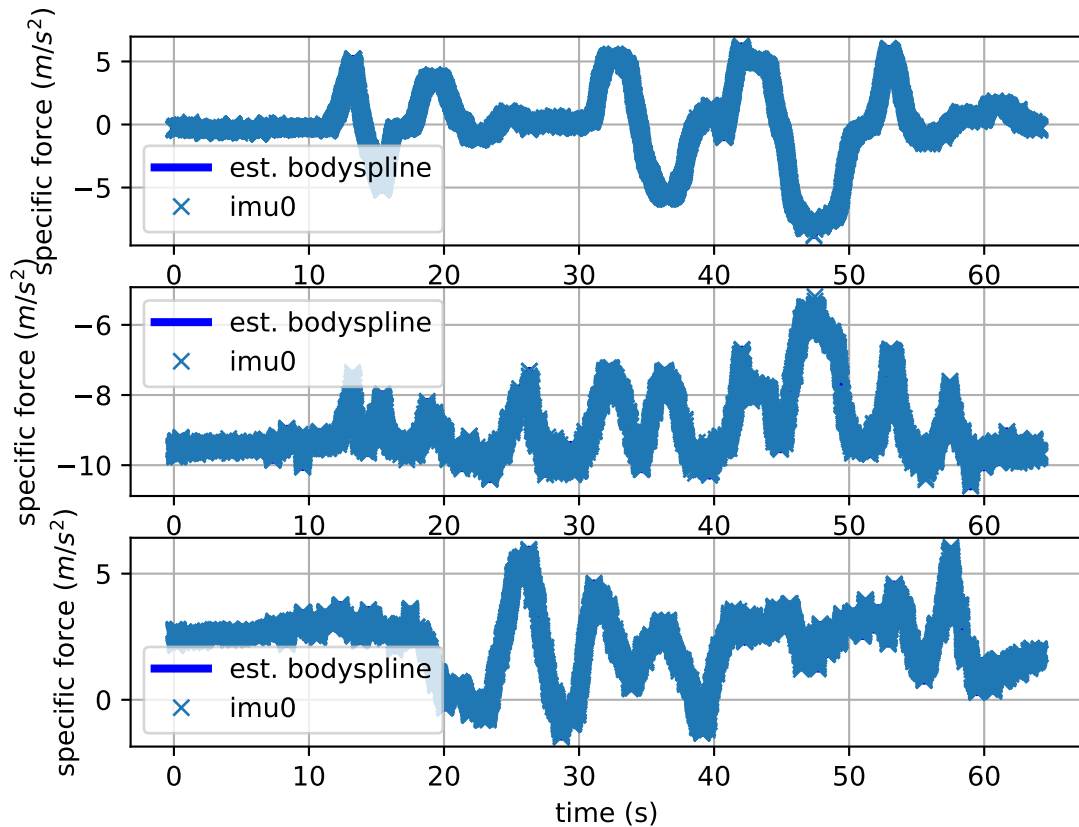
imu0: estimated poses



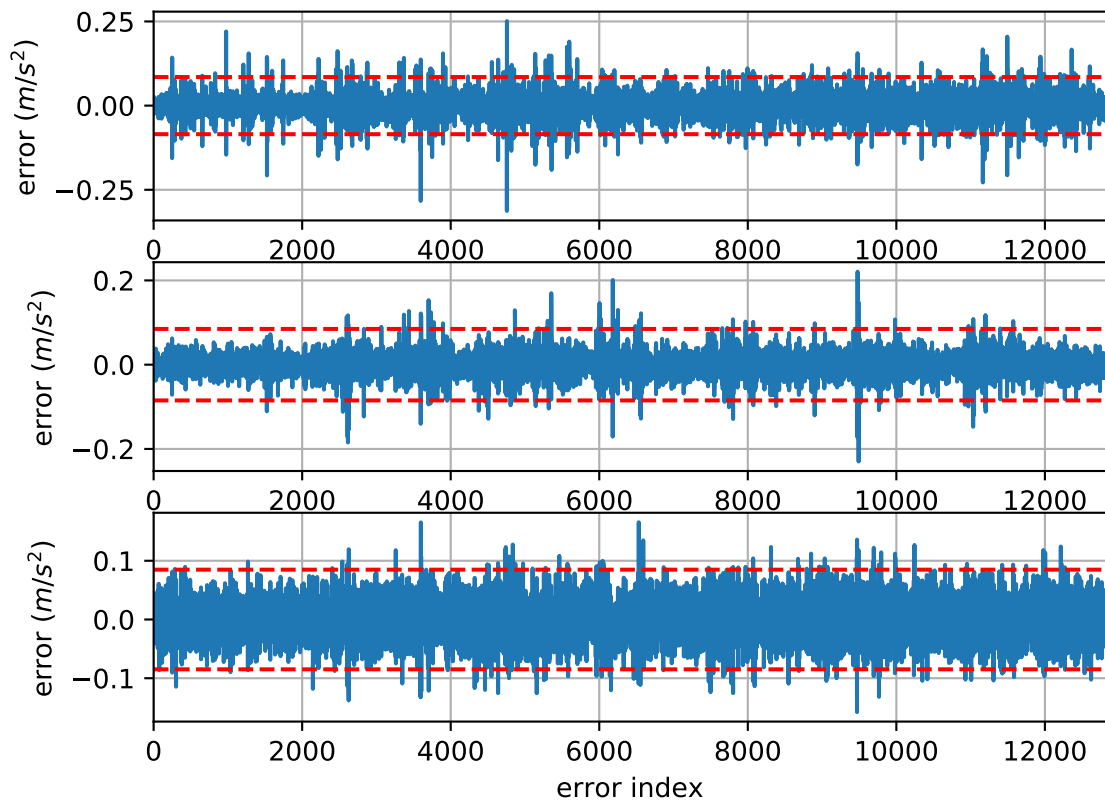
imu0: sample inertial rate



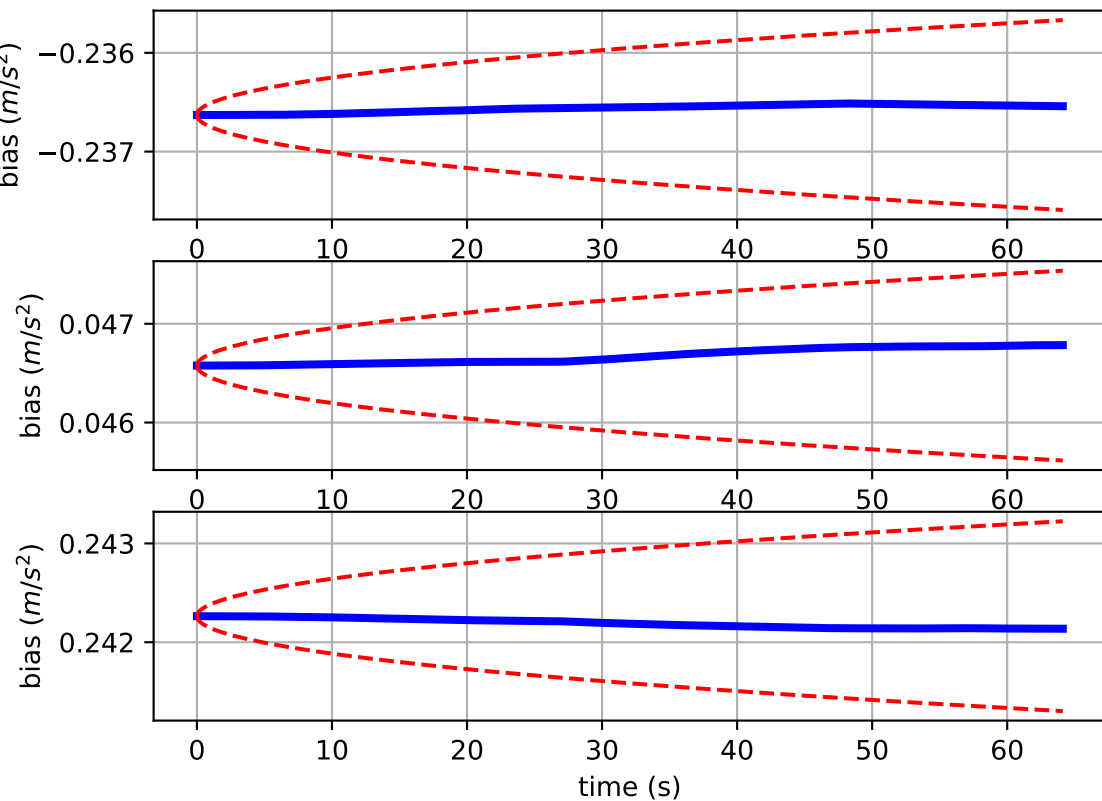
Comparison of predicted and measured specific force (imu0 frame)



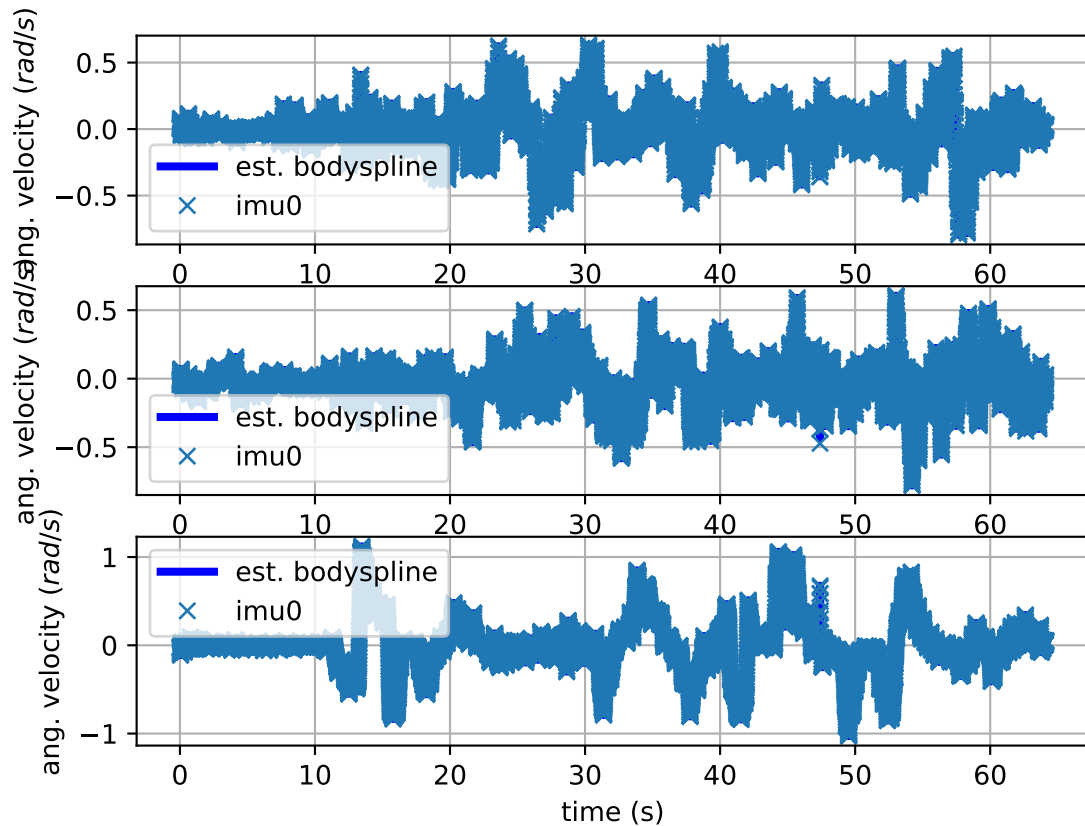
imu0: acceleration error



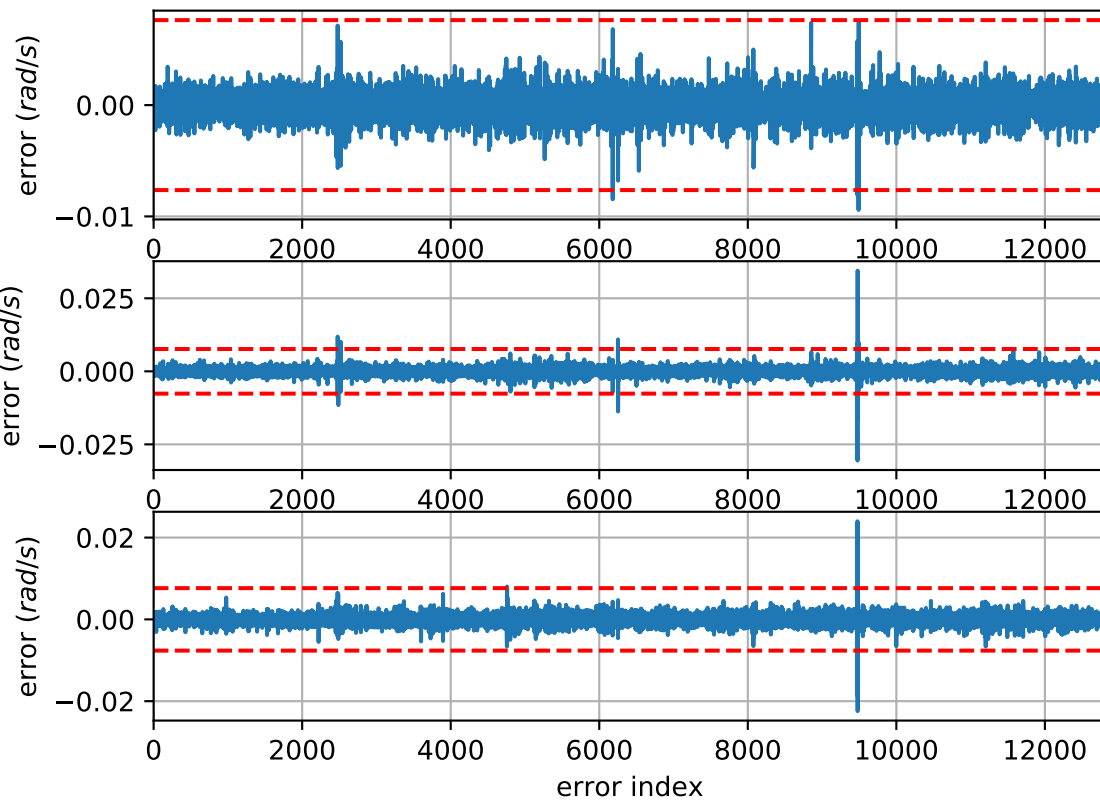
imu0: estimated accelerometer bias (imu frame)



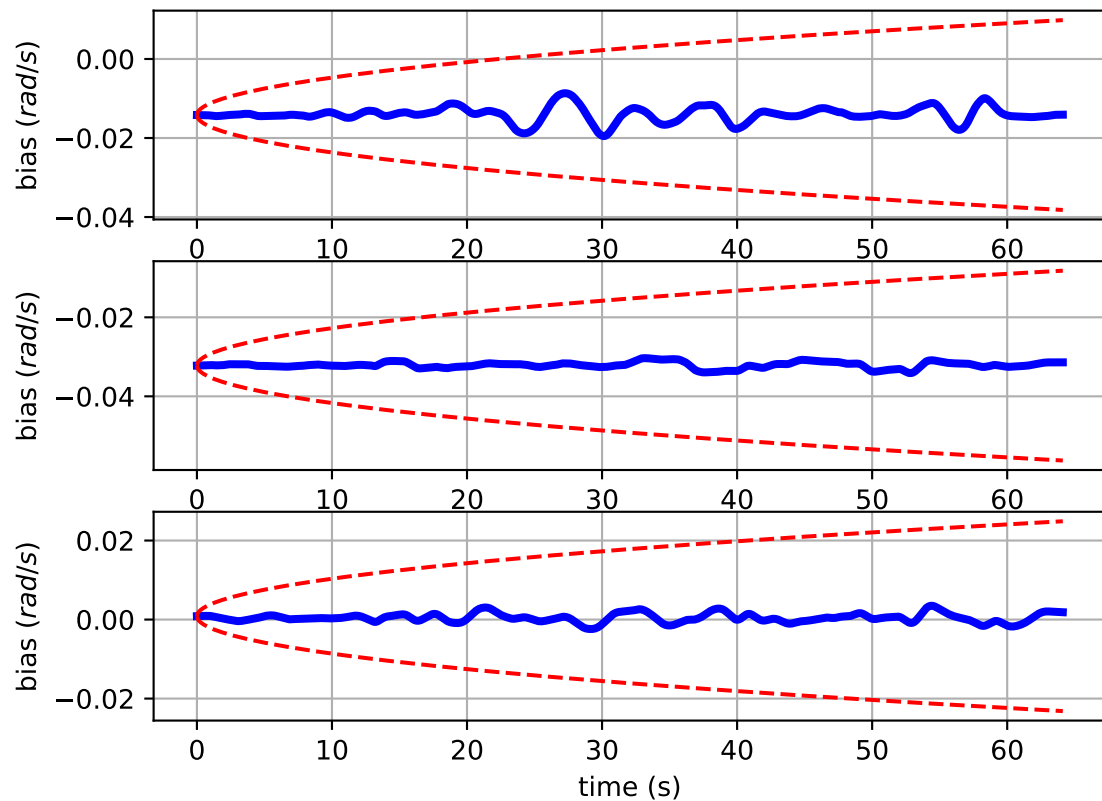
Comparison of predicted and measured angular velocities (body frame)



imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors

