

Calibration results

=====

Normalized Residuals

Reprojection error (cam0): mean 0.29503208082301646, median 0.2202468904397969, std: 0.2697280451160753
Gyroscope error (imu0): mean 0.44724111596751626, median 0.3655993828582134, std: 0.3865956873693782
Accelerometer error (imu0): mean 0.4831806265019037, median 0.32905994072470357, std: 0.6110953257685996

Residuals

Reprojection error (cam0) [px]: mean 0.29503208082301646, median 0.2202468904397969, std: 0.2697280451160753
Gyroscope error (imu0) [rad/s]: mean 0.0019283370947362321, median 0.0015763283531145015, std: 0.0016668565970432137
Accelerometer error (imu0) [m/s^2]: mean 0.13088915340804702, median 0.0891392880831676, std: 0.16554005987479628

Transformation (cam0):

T_ci: (imu0 to cam0):

[[-0.99995296 0.00261059 0.00934181 -0.06742767]
[-0.00935767 -0.00612951 -0.99993743 -0.04515344]
[-0.00255317 -0.99997781 0.00615366 -0.09428122]
[0. 0. 0. 1.]]

T_ic: (cam0 to imu0):

[[-0.99995296 -0.00935767 -0.00255317 -0.06808775]
[0.00261059 -0.00612951 -0.99997781 -0.09437987]
[0.00934181 -0.99993743 0.00615366 -0.04394054]
[0. 0. 0. 1.]]

timeshift cam0 to imu0: [s] ($t_{imu} = t_{cam} + \text{shift}$)
-0.005459365924792495

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

[-0.02160162 -9.73449686 -1.18639251]

Calibration configuration

=====

cam0

Camera model: pinhole

Focal length: [386.34806423050134, 385.8625169445687]

Principal point: [317.60737813821476, 246.9146938522054]

Distortion model: radtan

Distortion coefficients: [-0.34328899505475824, 0.11935125055764675, -0.00038008623018016575, -0.0016809729626813164]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.088 [m]

Spacing 0.026399999999999996 [m]

IMU configuration

=====

IMU0:

Model: calibrated

Update rate: 100

Accelerometer:

Noise density: 0.02708907316

Noise density (discrete): 0.2708907316

Random walk: 0.00264054372

Gyroscope:

Noise density: 0.00043116275

Noise density (discrete): 0.0043116275

Random walk: 5.597187e-05

T_ib (imu0 to imu0)

[[1. 0. 0. 0.]

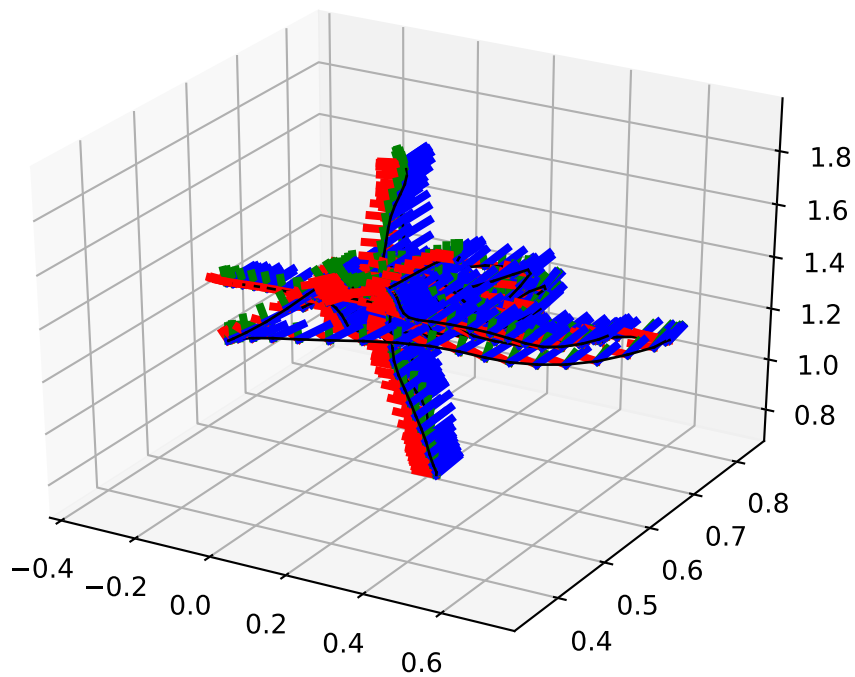
[0. 1. 0. 0.]

[0. 0. 1. 0.]

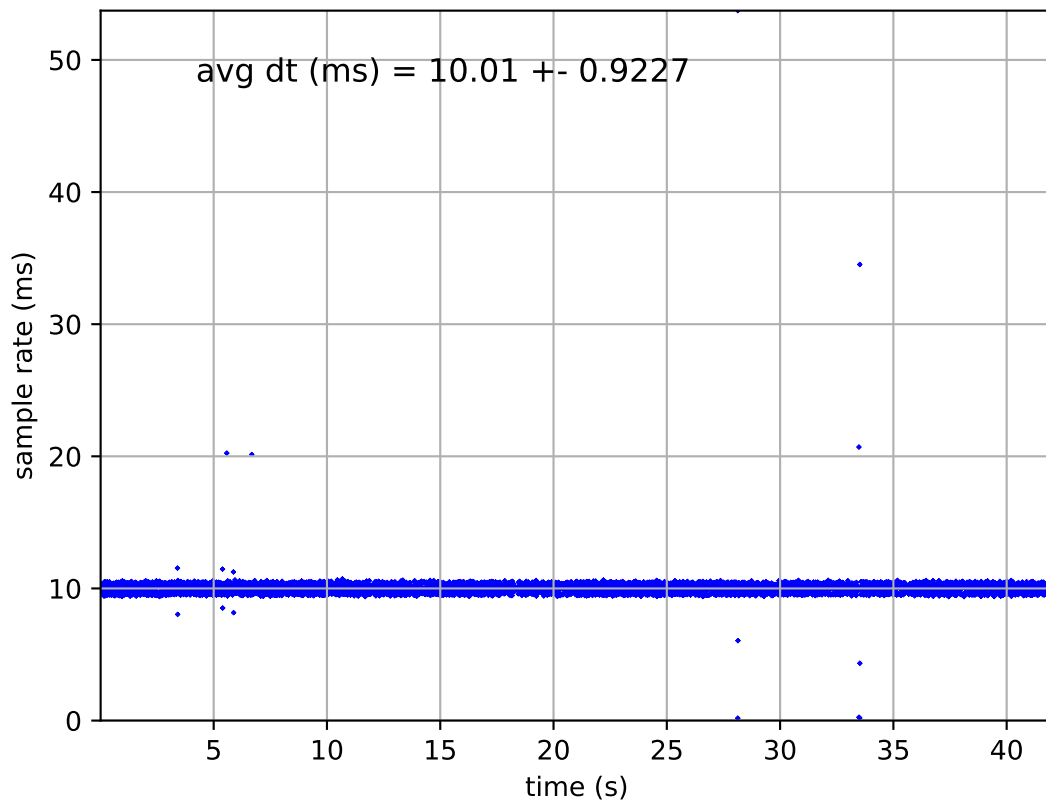
[0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

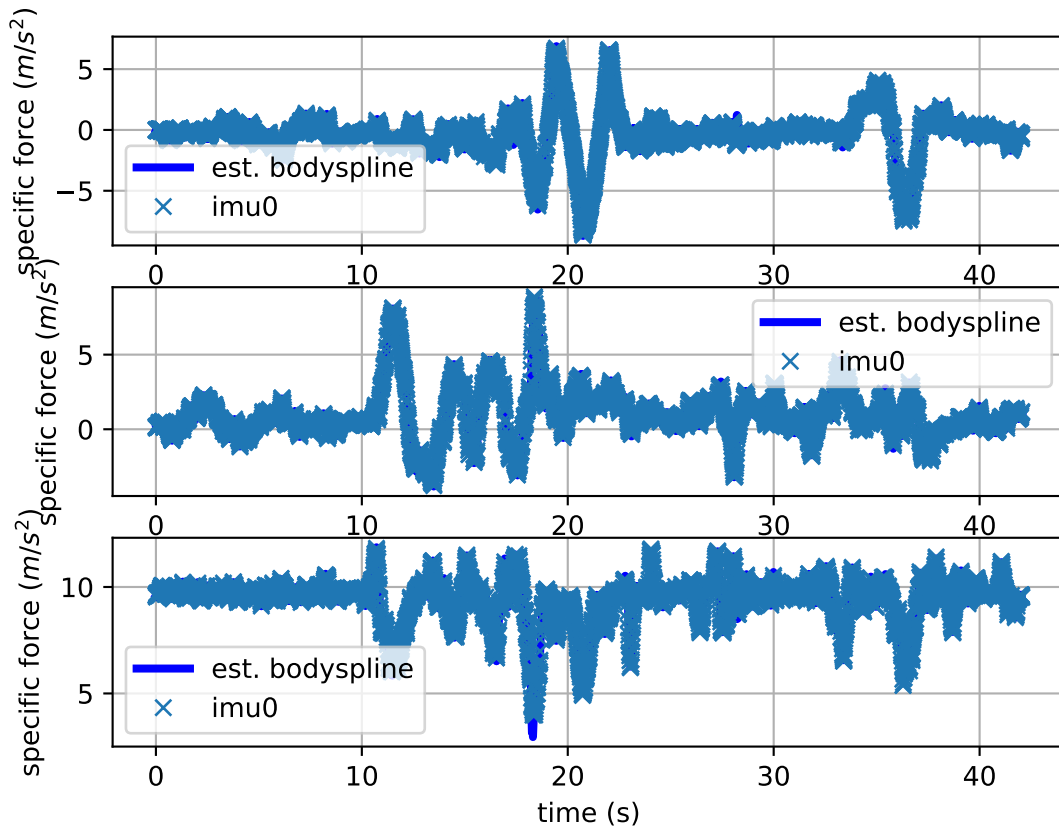
imu0: estimated poses



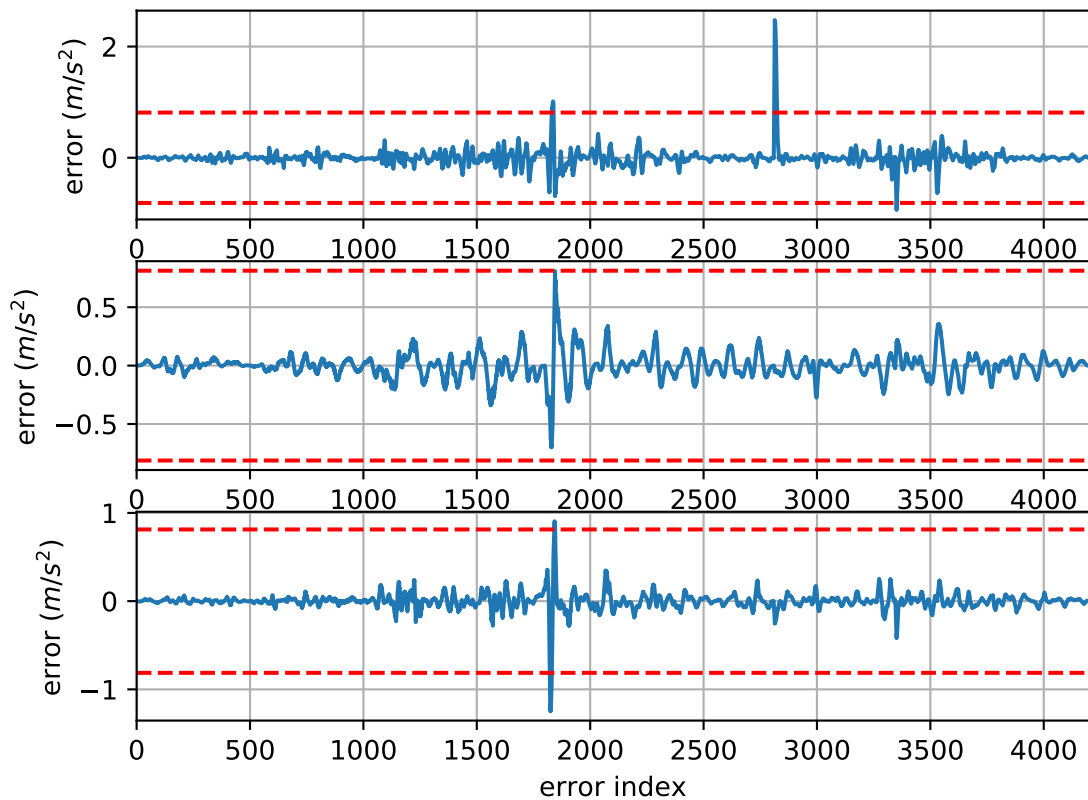
imu0: sample inertial rate



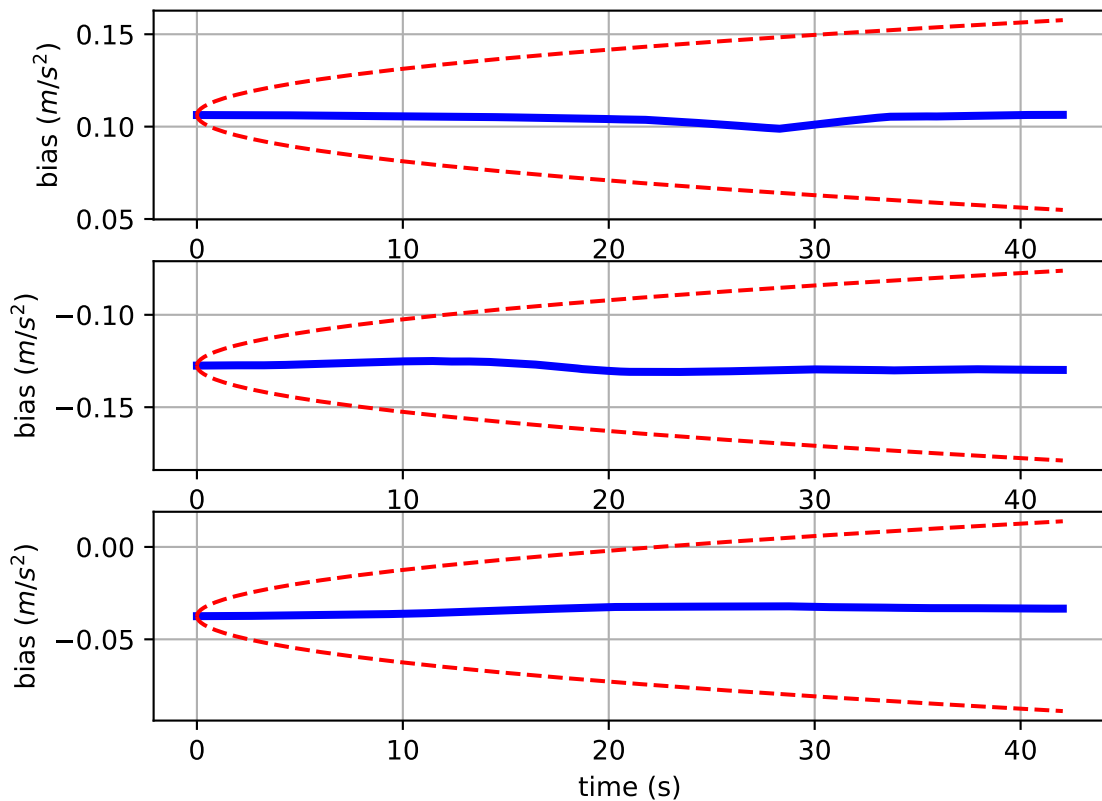
Comparison of predicted and measured specific force (imu0 frame)



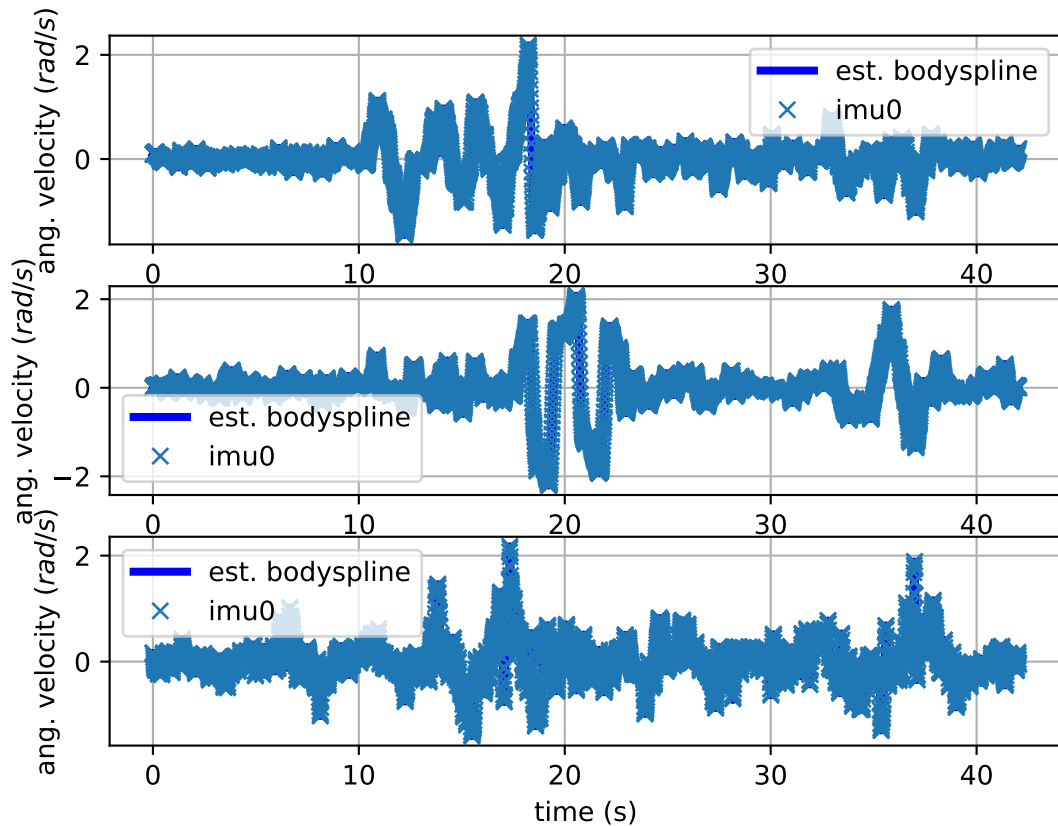
imu0: acceleration error



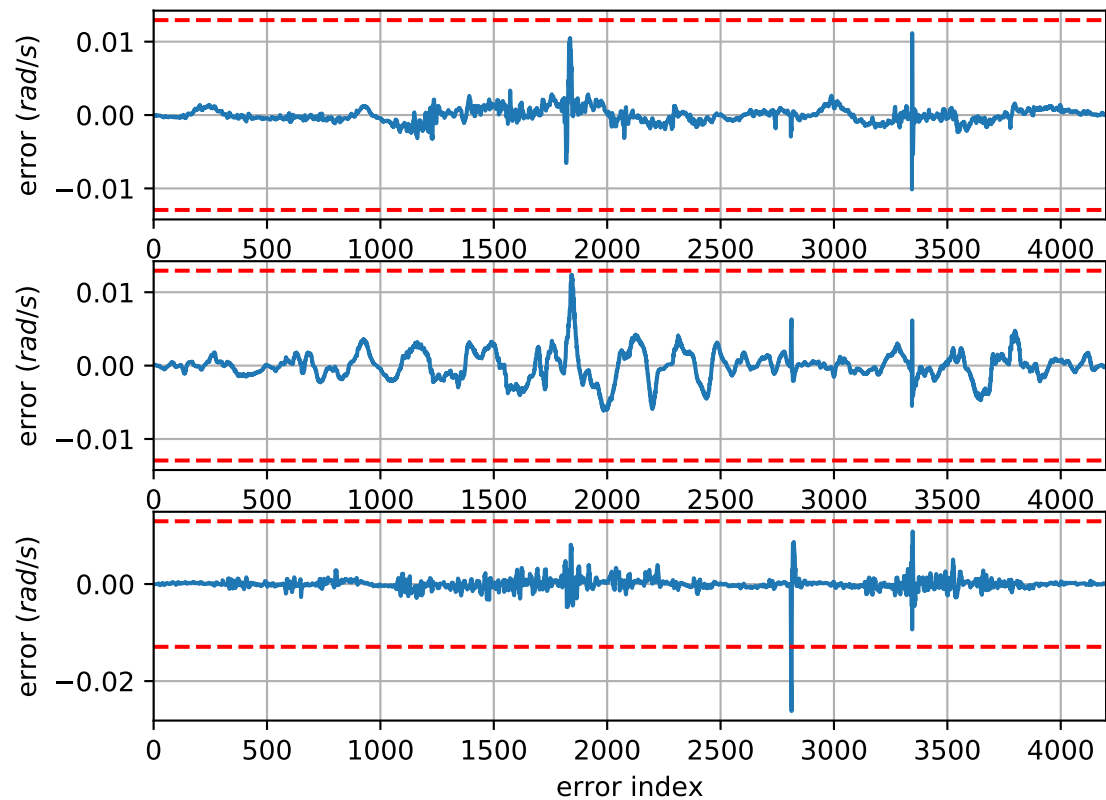
imu0: estimated accelerometer bias (imu frame)



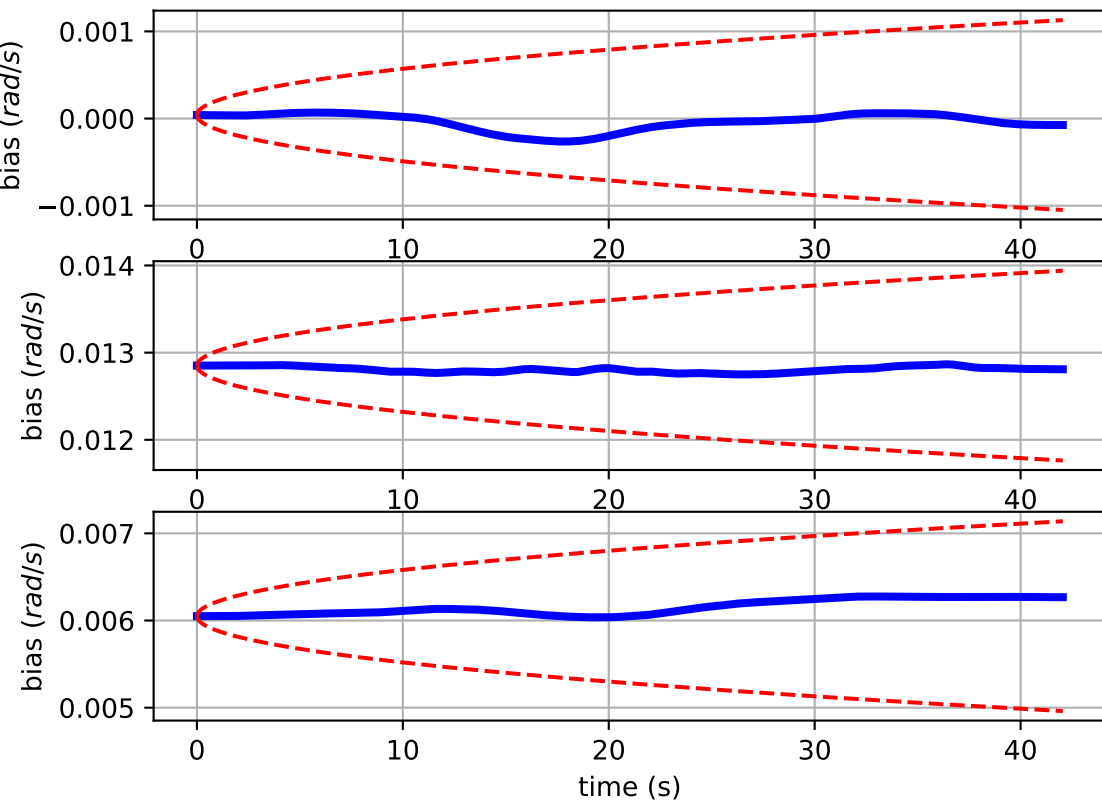
Comparison of predicted and measured angular velocities (body frame)



imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors

