

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 0.30101949514, median 0.285612082843, std: 0.154486933908
Reprojection error (cam1): mean 0.290815992567, median 0.275900479689, std: 0.150259872253
Gyroscope error (imu0): mean 41.1012444566, median 20.8950545607, std: 59.9491365953
Accelerometer error (imu0): mean 6.90958146545, median 3.96262272738, std: 9.5993463762

Residuals

Reprojection error (cam0) [px]: mean 0.30101949514, median 0.285612082843, std: 0.154486933908
Reprojection error (cam1) [px]: mean 0.290815992567, median 0.275900479689, std: 0.150259872253
Gyroscope error (imu0) [rad/s]: mean 0.0999766122263, median 0.0508261196196, std: 0.145823117084
Accelerometer error (imu0) [m/s^2]: mean 0.273605466925, median 0.156911854502, std: 0.38011472338

Transformation (cam0):

T_ci: (imu0 to cam0):
[[0.00148462 -0.99995664 -0.00919322 0.00268561]
[0.02626535 0.00922905 -0.9996124 0.00090237]
[0.9996539 0.00124258 0.02627791 0.00062879]
[0. 0. 0. 1.]]

T_ic: (cam0 to imu0):
[[0.00148462 0.02626535 0.9996539 -0.00065626]
[-0.99995664 0.00922905 0.00124258 0.00267638]
[-0.00919322 -0.9996124 0.02627791 0.00091019]
[0. 0. 0. 1.]]

timeshift cam0 to imu0: [s] ($t_{imu} = t_{cam} + \text{shift}$)
-0.0416022582112

Transformation (cam1):

T_ci: (imu0 to cam1):

[0. 0. 0. 1.]]

T_ic: (cam1 to imu0):

[[-0.00168439 0.02567432 0.99966894 -0.00085891]
[-0.99995627 0.00915295 -0.00191994 -0.06713569]
[-0.00919921 -0.99962846 0.02565778 0.00157598]
[0. 0. 0. 1.]]

timeshift cam1 to imu0: [s] (t_imu = t_cam + shift)

-0.0493674064857

Baselines:

Baseline (cam0 to cam1):

[[0.99999498 -0.00007724 -0.00316806 -0.06980324]
[0.00007537 0.99999982 -0.00059134 0.00130973]
[0.00316811 0.0005911 0.999999481 0.00005147]
[0. 0. 0. 1.]]

baseline norm: 0.0698155441315 [m]

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

[-0.37131726 -9.78903666 -0.45310882]

Calibration configuration

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cam0

Camera model: pinhole

Focal length: [350.6710644389852, 350.2475087910409]

Principal point: [329.2739557834024, 193.25709071404128]

Distortion model: radtan

Distortion coefficients: [0.008147778356836785, -0.0037053354094802515, 0.00233892524850841, -0.00

Type: aprilgrid

Tags:

Spacing 0.02610294 [m]

cam1

Camera model: pinhole

Focal length: [350.4040190156699, 349.8618071780678]

Principal point: [332.64898397418125, 193.11729278832107]

Distortion model: radtan

Distortion coefficients: [0.007140913951502129, -0.0038466488085136773, 0.0021614899865584404, 0.00012345678901234567, 0.00012345678901234567, 0.00012345678901234567]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.0878 [m]

Spacing 0.02610294 [m]

IMU configuration

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IMU0:

Model: calibrated

Update rate: 800.0

Accelerometer:

Noise density: 0.0014

Noise density (discrete): 0.0395979797464

Random walk: 8e-05

Gyroscope:

Noise density: 8.6e-05

Noise density (discrete): 0.00243244732728

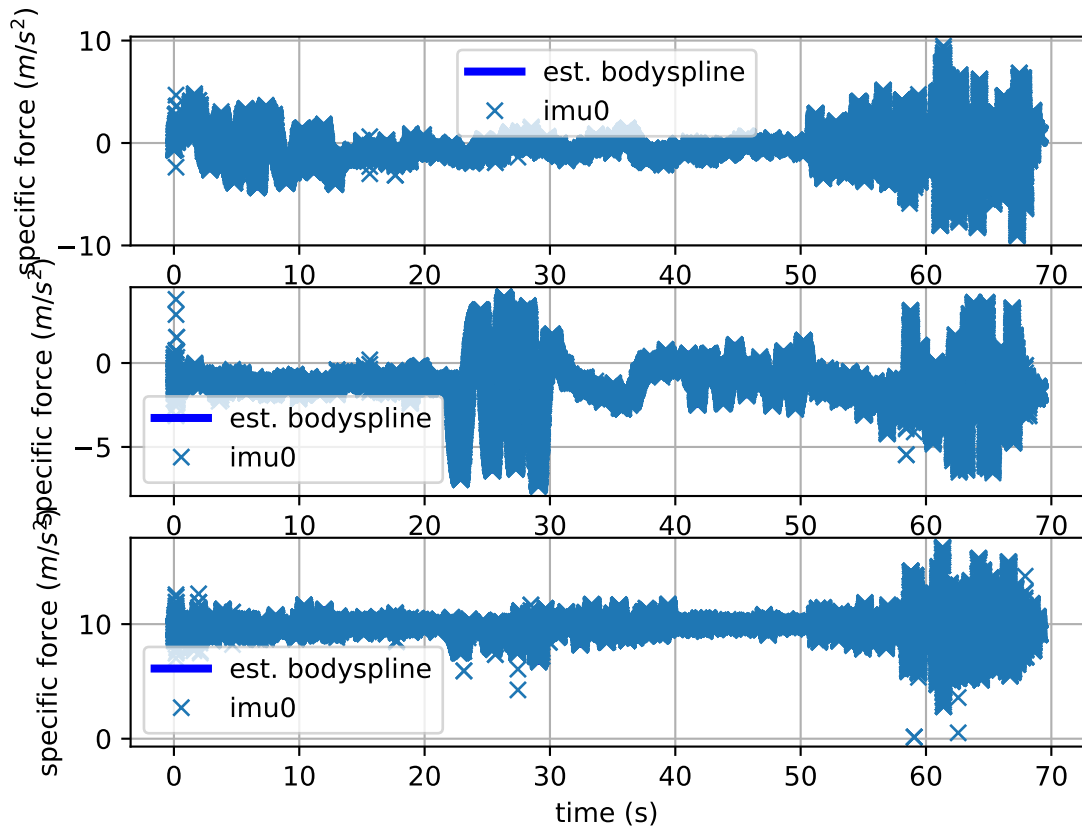
Random walk: 2.2e-06

T_i_b

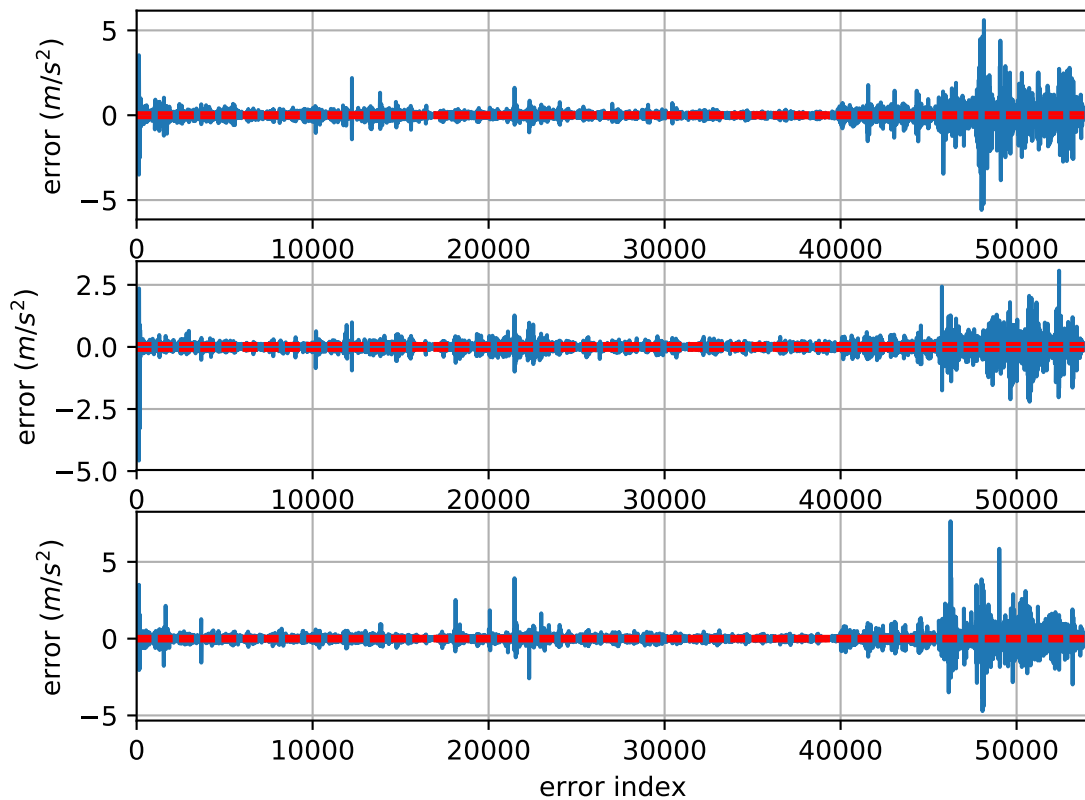
[[1. 0. 0. 0.]

[0. 1. 0. 0.]

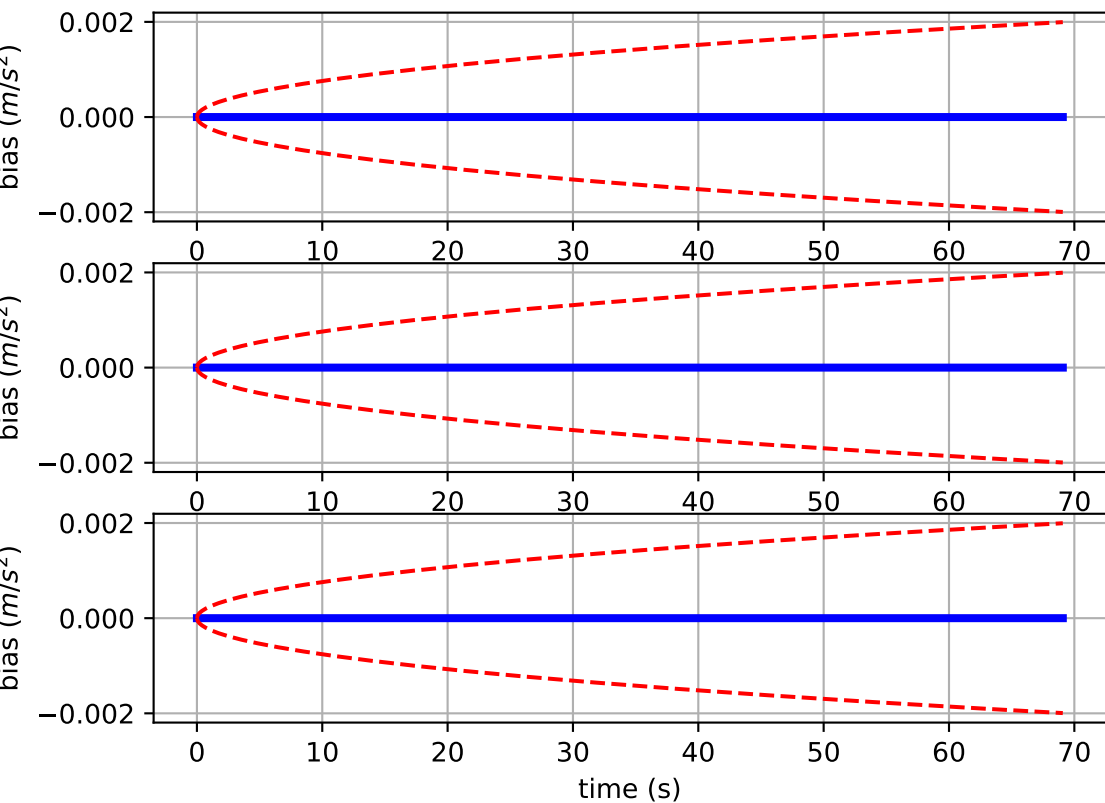
Comparison of predicted and measured specific force (imu0 frame)



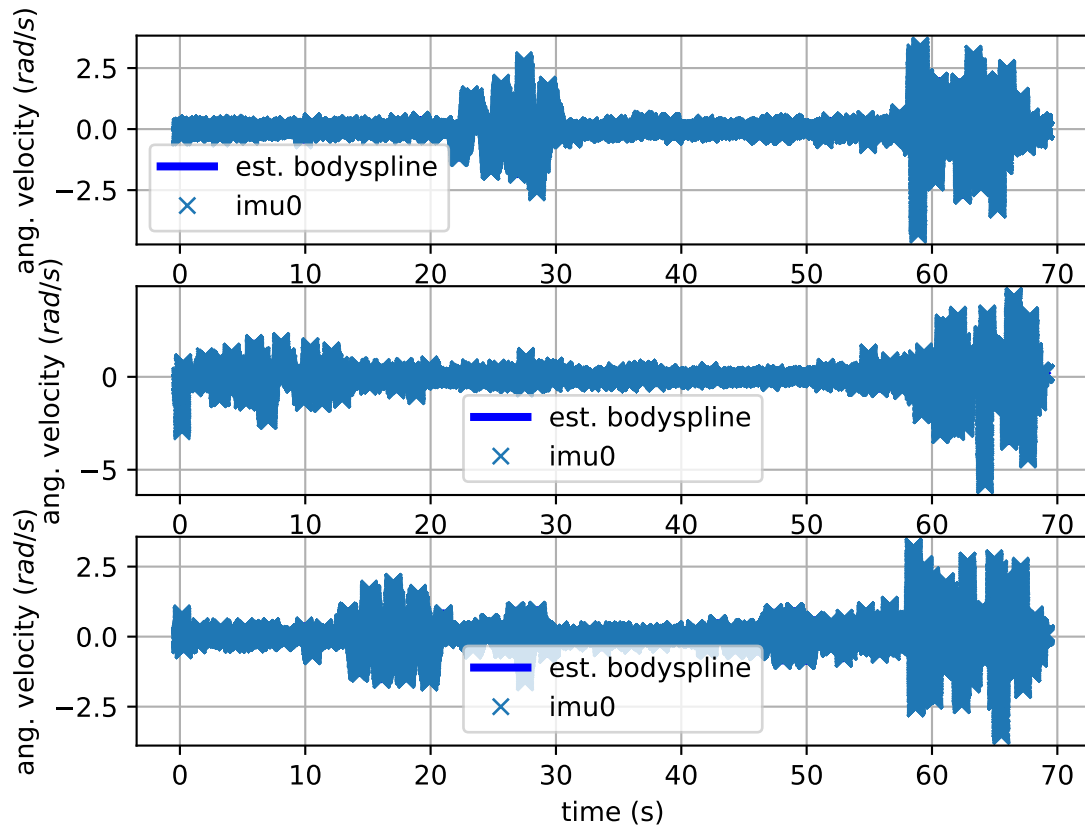
imu0: acceleration error



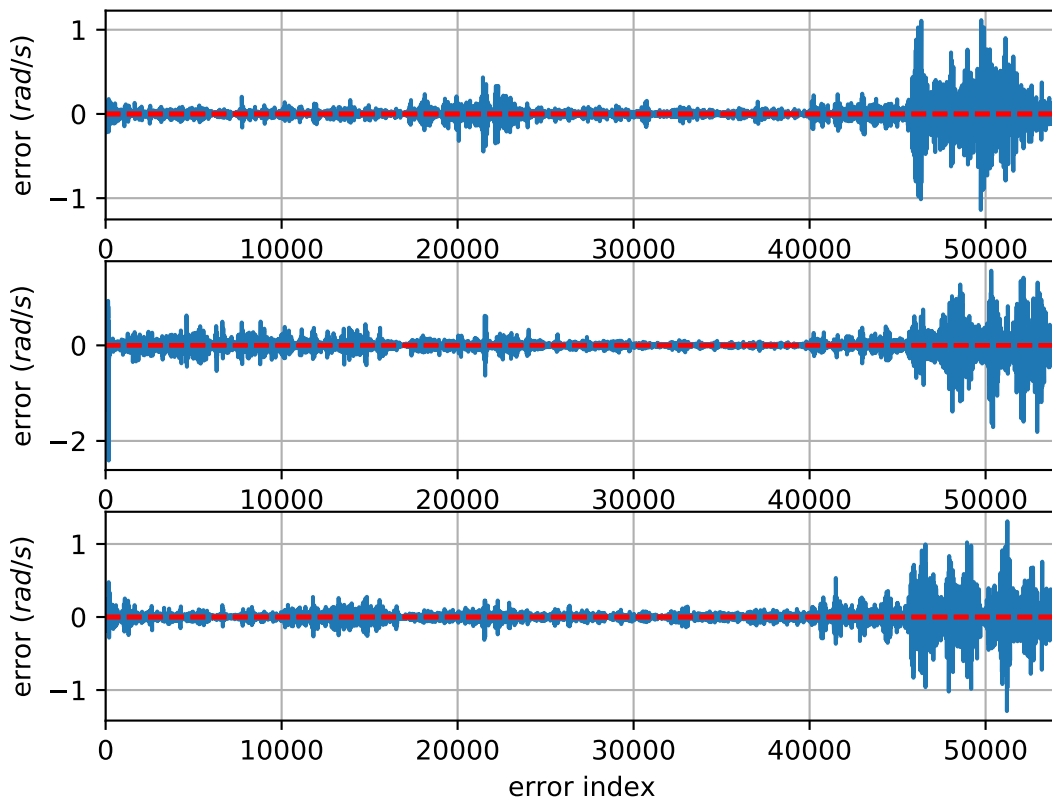
imu0: estimated accelerometer bias (imu frame)



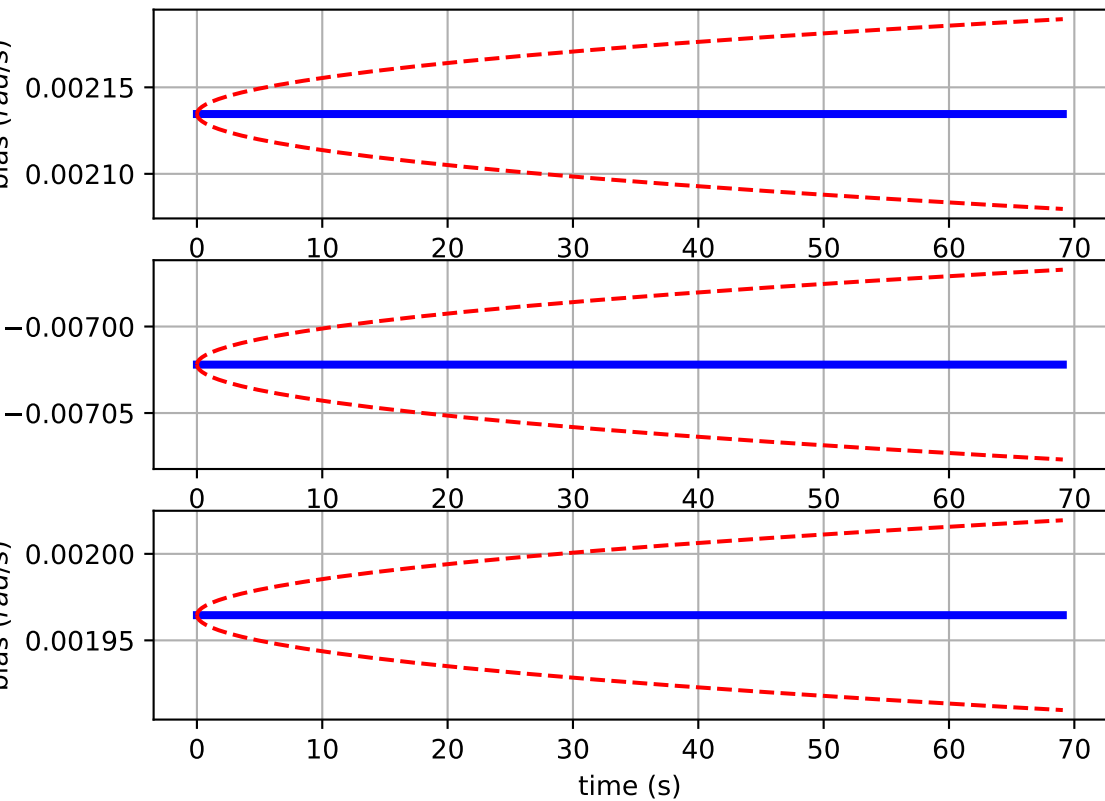
Comparison of predicted and measured angular velocities (body frame)



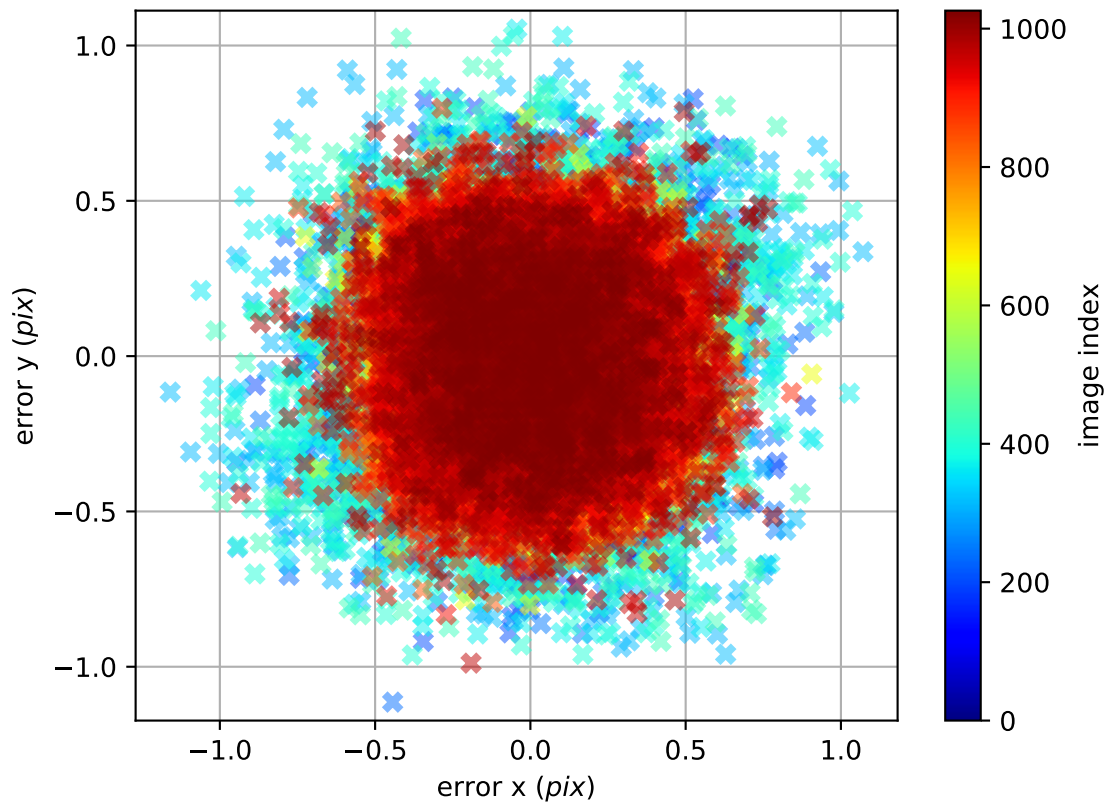
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

