

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 0.15081123137651103, median 0.13361884436050106, std: 0.0956825854703672
Reprojection error (cam1): mean 0.15071675366734072, median 0.13312224386788132, std: 0.09443399249299796
Gyroscope error (imu0): mean 6.822614259419433e-11, median 4.72276458389135e-12, std: 8.489566653770558e-10
Accelerometer error (imu0): mean 7.055664732684284e-11, median 3.61977534950532e-12, std: 1.1792851258282347e-09

Residuals

Reprojection error (cam0) [px]: mean 0.15081123137651103, median 0.13361884436050106, std: 0.09568258547036719
Reprojection error (cam1) [px]: mean 0.15071675366734072, median 0.13312224386788132, std: 0.09443399249299796
Gyroscope error (imu0) [rad/s]: mean 1.6213334561331188e-12, median 1.1223229005995772e-13, std: 2.017469832011516e-11
Accelerometer error (imu0) [m/s^2]: mean 1.086755924635227e-11, median 5.575395736564232e-13, std: 1.8164058892867186e-10

Transformation (cam0):

T_ci: (imu0 to cam0):
[[-0.01864596 -0.99970201 -0.01575488 0.0008122]
 [0.18247761 0.01209031 -0.98313567 -0.00118845]
 [0.98303319 -0.02120642 0.1821978 -0.00006961]
 [0. 0. 0. 1.]]

T_ic: (cam0 to imu0):
[[-0.01864596 0.18247761 0.98303319 0.00030044]
 [-0.99970201 0.01209031 -0.02120642 0.00082485]
 [-0.01575488 -0.98313567 0.1821978 -0.00114293]
 [0. 0. 0. 1.]]

timeshift cam0 to imu0: [s] (t_imu = t_cam + shift)
0.0007393121017207066

Transformation (cam1):

T_ci: (imu0 to cam1):
[[-0.01681661 -0.99972813 -0.01615123 -0.04980425]
 [0.17803996 0.0129013 -0.98393868 -0.00121544]
 [0.98387955 -0.01942208 0.1777746 -0.00085644]
 [0. 0. 0. 1.]]

T_ic: (cam1 to imu0):
[[-0.01681661 0.17803996 0.98387955 0.00022149]
 [-0.99972813 0.0129013 -0.01942208 -0.04979166]
 [-0.01615123 -0.98393868 0.1777746 -0.00184807]
 [0. 0. 0. 1.]]

timeshift cam1 to imu0: [s] (t_imu = t_cam + shift)
0.0004903618022585052

Baselines:

Baseline (cam0 to cam1):
[[0.99999825 0.00072317 0.00172665 -0.05061547]
 [-0.00071535 0.9999895 -0.00452586 -0.00002674]
 [-0.00172991 0.00452462 0.99998827 -0.00078005]
 [0. 0. 0. 1.]]

baseline norm: 0.050621490035511675 [m]

Gravity vector in target coords: [m/s^2]
[9.80373474 0.18308494 -0.1472686]

Calibration configuration

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cam0

Camera model: pinhole
Focal length: [385.9663579533714, 386.66632586105874]
Principal point: [326.31560591362586, 228.94820856640544]
Distortion model: radtan
Distortion coefficients: [-0.006216881543788755, -0.008965831146637354, -0.006699760163435405,
0.004722332098436569]
Type: checkerboard
Rows
 Count: 8
 Distance: 0.0248 [m]
Cols
 Count: 6
 Distance: 0.0248 [m]

cam1

Camera model: pinhole
Focal length: [386.5092116377738, 386.6137952578704]
Principal point: [324.9424812770913, 231.01404187987941]
Distortion model: radtan
Distortion coefficients: [0.0008912292688776762, -0.049744871536725306, -0.003605966286580121,
0.0028794430597202047]
Type: checkerboard
Rows
 Count: 8
 Distance: 0.0248 [m]
Cols
 Count: 6
 Distance: 0.0248 [m]

IMU configuration

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IMU0:

Model: calibrated

Update rate: 200.0

Accelerometer:

Noise density: 0.010891283995460944

Noise density (discrete): 0.154026015380379

Random walk: 0.0001787920692948497

Gyroscope:

Noise density: 0.0016803762279444879

Noise density (discrete): 0.02376410851448438

Random walk: 2.7945920744214167e-05

T_ib (imu0 to imu0)

[[1. 0. 0. 0.]

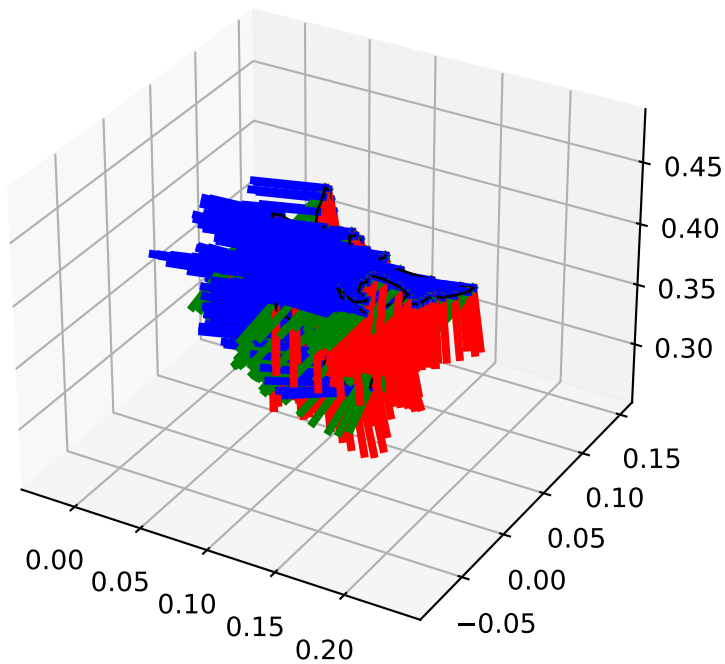
[0. 1. 0. 0.]

[0. 0. 1. 0.]

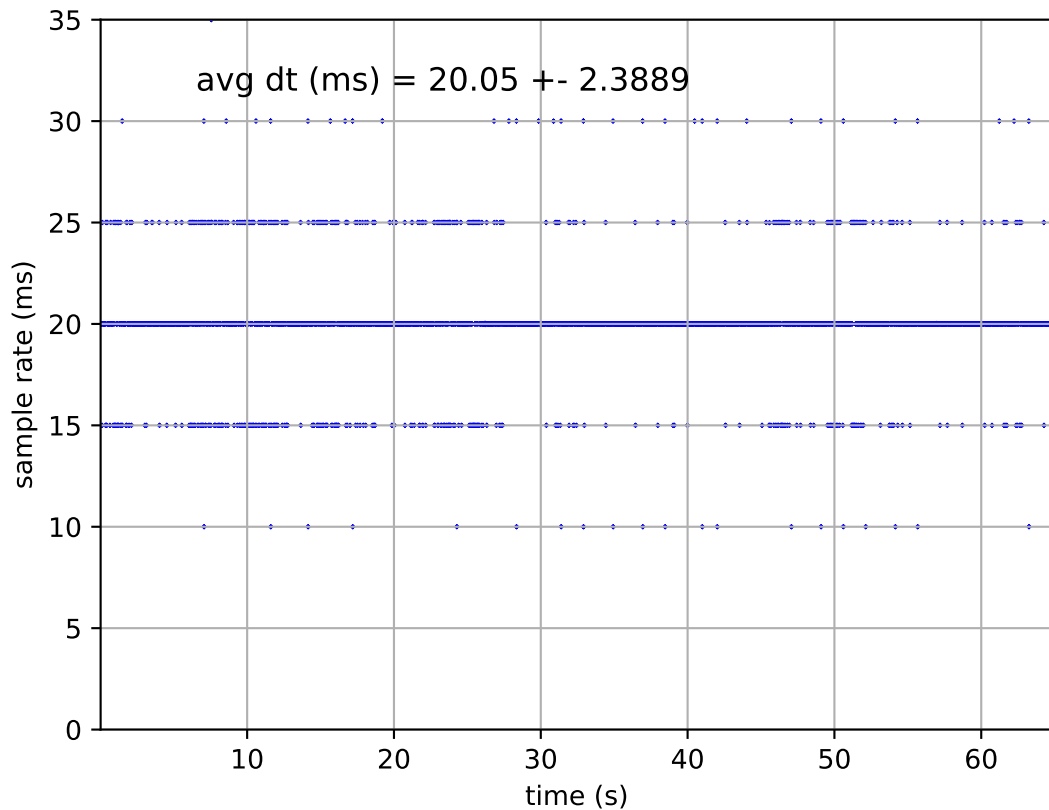
[0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

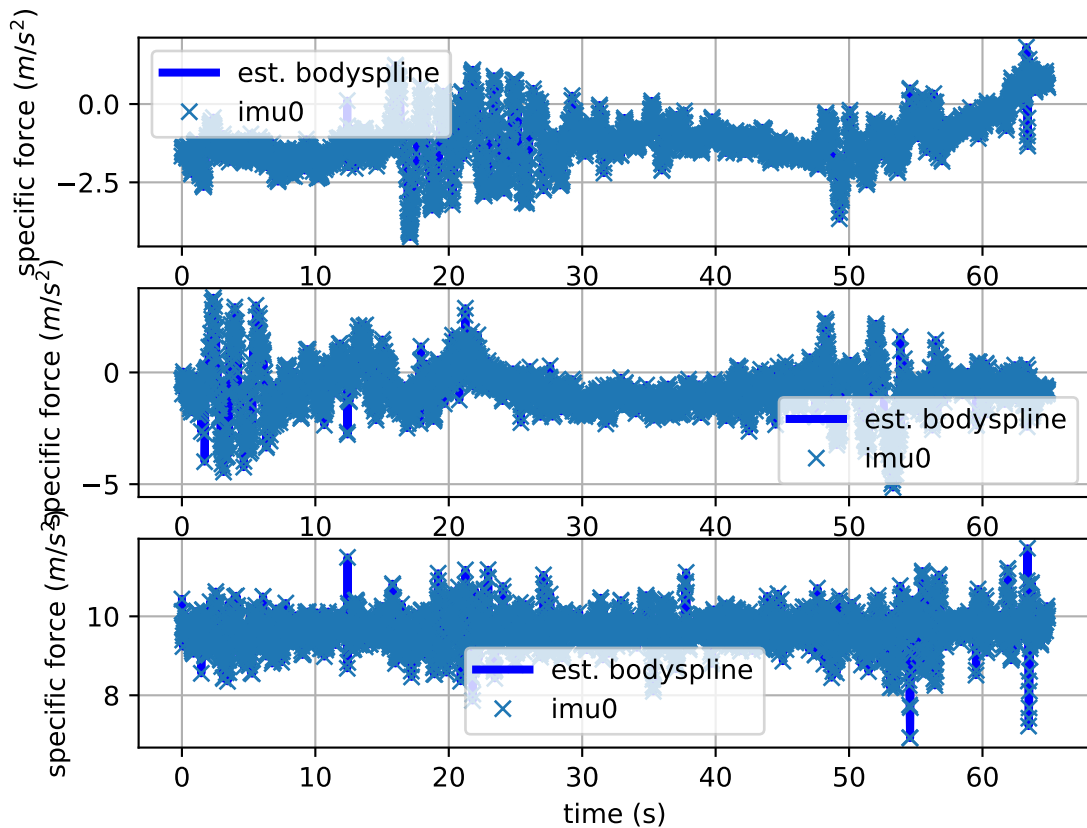
imu0: estimated poses



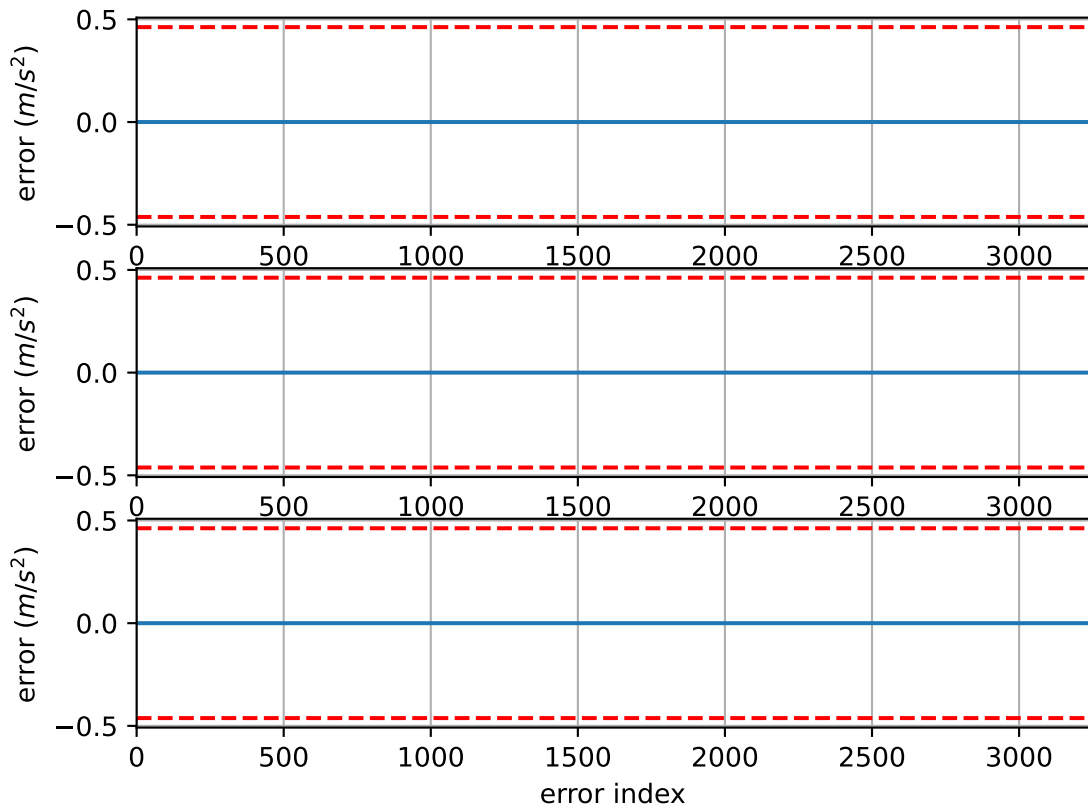
imu0: sample inertial rate



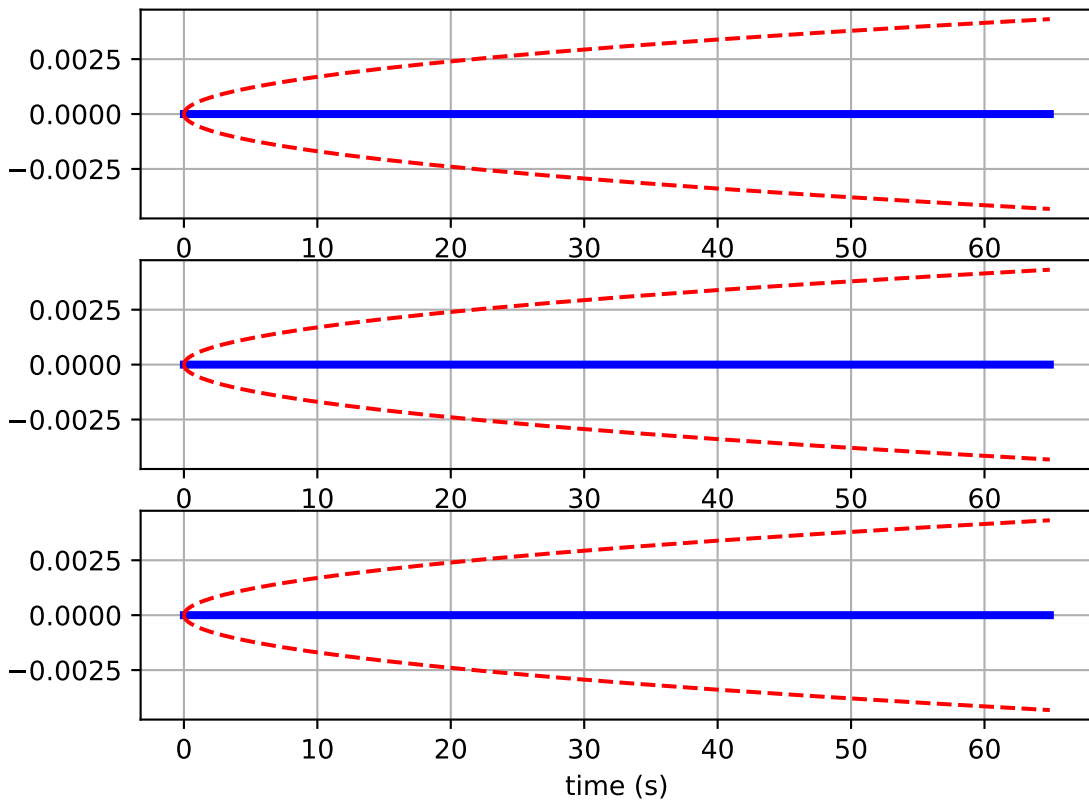
Comparison of predicted and measured specific force (imu0 frame)



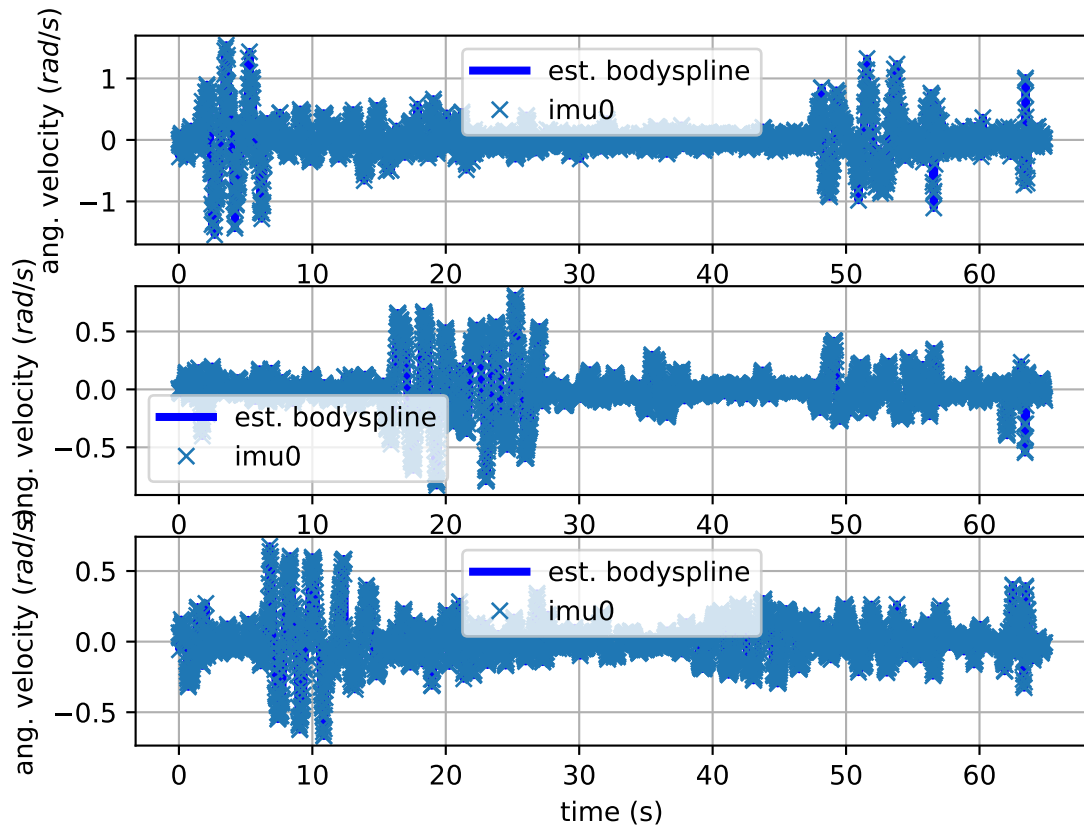
imu0: acceleration error



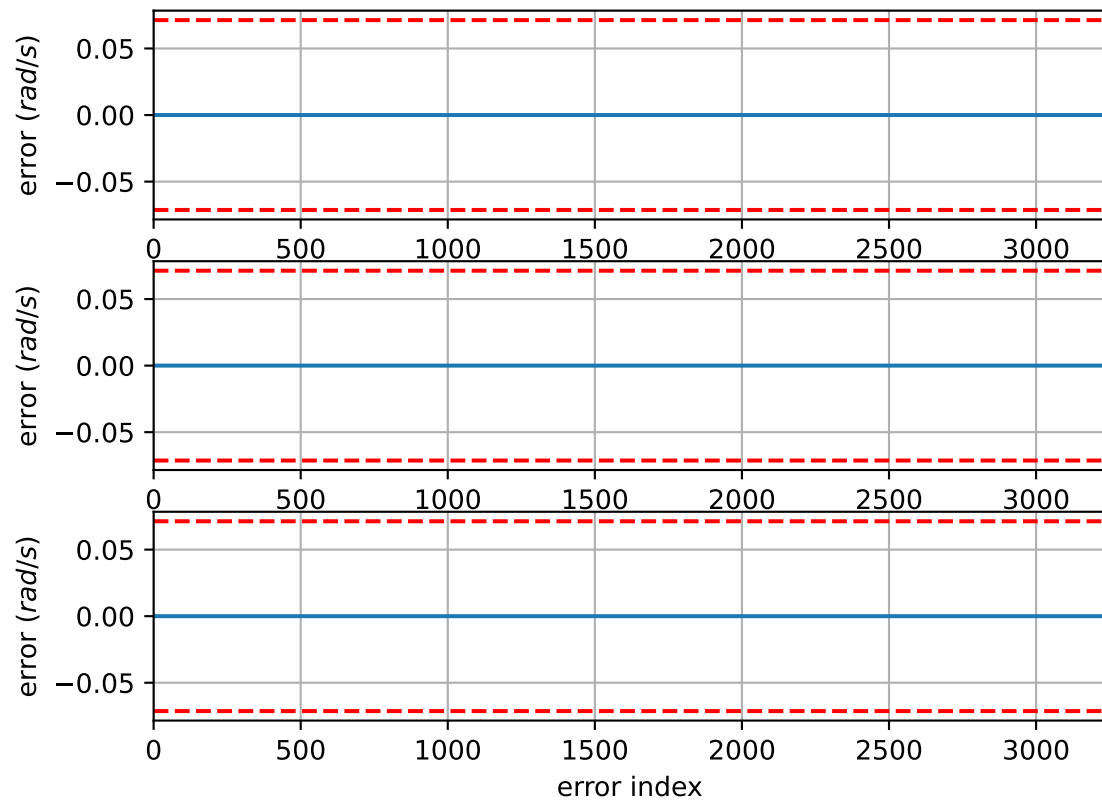
imu0: estimated accelerometer bias (imu frame)



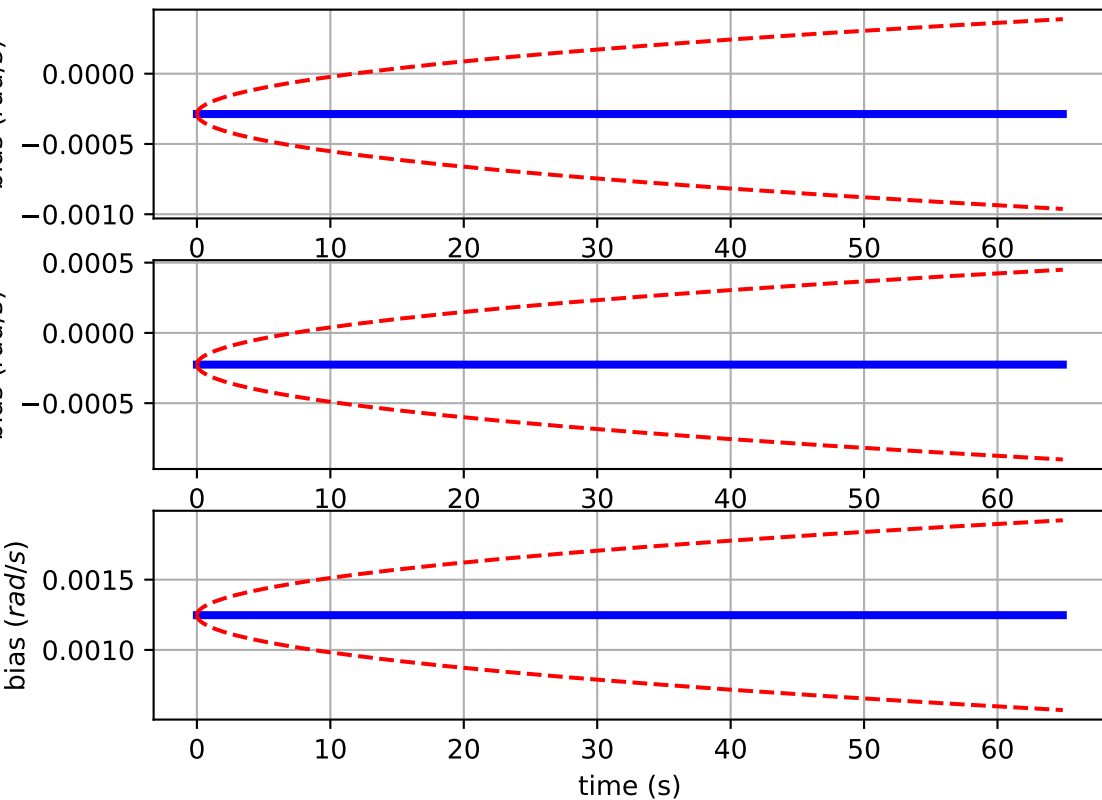
Comparison of predicted and measured angular velocities (body frame)



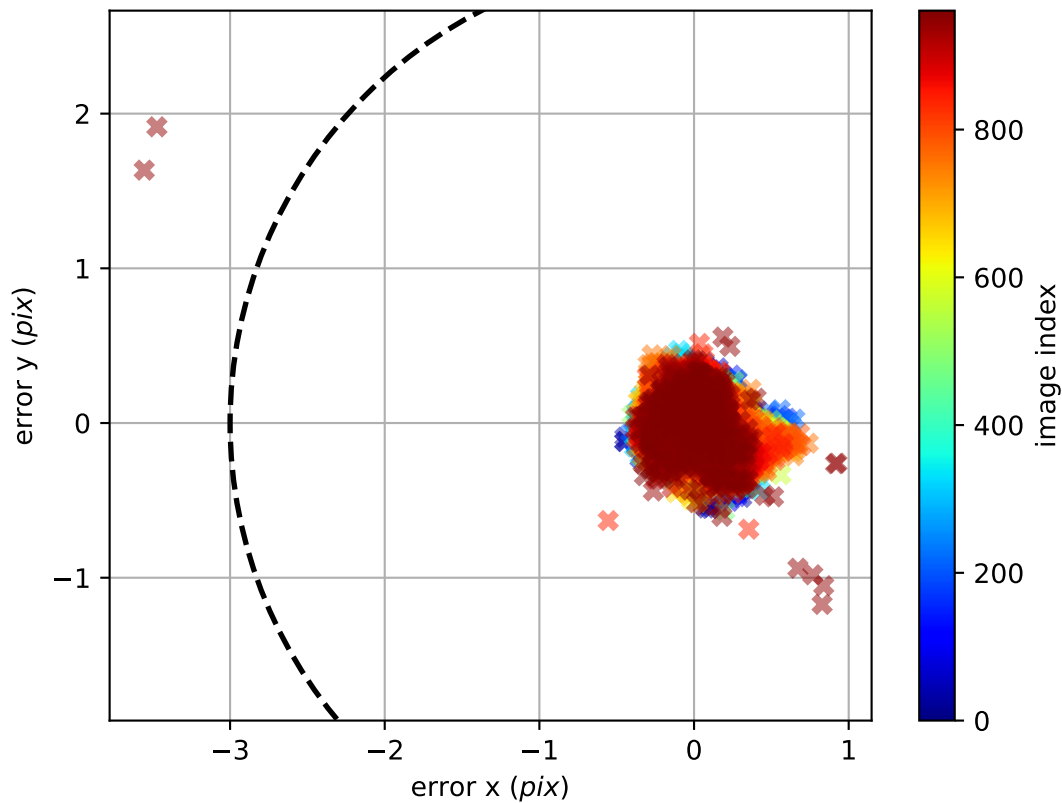
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

