

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 0.4740010838805192, median 0.3811225918686767, std: 0.3520863150991674
Reprojection error (cam1): mean 0.5246851573251972, median 0.4046585385611232, std: 0.4335039662500085
Gyroscope error (imu0): mean 0.005548760296578411, median 0.0024860918179104028, std: 0.008249991562830863
Accelerometer error (imu0): mean 0.002090796049737236, median 0.001917767546502679, std: 0.0005583970432020046

Residuals

Reprojection error (cam0) [px]: mean 0.4740010838805192, median 0.3811225918686767, std: 0.3520863150991674
Reprojection error (cam1) [px]: mean 0.5246851573251972, median 0.4046585385611232, std: 0.4335039662500085
Gyroscope error (imu0) [rad/s]: mean 4.646531408888254e-05, median 2.0818530806645274e-05, std: 6.908542245624646e-05
Accelerometer error (imu0) [m/s^2]: mean 0.00010795870940062299, median 9.902434495074183e-05, std: 2.8832952943826626e-05

Transformation (cam0):

T_ci: (imu0 to cam0):

```
[[ 0.02360421  0.99941947 -0.02456747  0.0082003 ]  
 [-0.00218331  0.0246258  0.99969435 -0.00047554]  
 [ 0.999719  -0.02354336  0.00276331 -0.00148904]  
 [ 0.      0.      0.      1.      ]]
```

T_ic: (cam0 to imu0):

```
[[ 0.02360421 -0.00218331  0.999719  0.00129402]  
 [ 0.99941947  0.0246258 -0.02354336 -0.00821889]  
 [-0.02456747  0.99969435  0.00276331  0.00068097]  
 [ 0.      0.      0.      1.      ]]
```

timeshift cam0 to imu0: [s] ($t_{imu} = t_{cam} + \text{shift}$)
-0.0008252025583107858

Transformation (cam1):

T_ci: (imu0 to cam1):
[[0.00475518 0.99965082 -0.02599297 -0.03984404]
 [0.01310507 0.02592874 0.99957789 -0.00027324]
 [0.99990282 -0.00509382 -0.0129772 0.00147192]
 [0. 0. 0. 1.]]

T_ic: (cam1 to imu0):
[[0.00475518 0.01310507 0.99990282 -0.00127873]
 [0.99965082 0.02592874 -0.00509382 0.03984471]
 [-0.02599297 0.99957789 -0.0129772 -0.00074344]
 [0. 0. 0. 1.]]

timeshift cam1 to imu0: [s] (t_imu = t_cam + shift)
0.00045656303256264057

Baselines:

Baseline (cam0 to cam1):
[[0.99982131 -0.00137821 -0.01885312 -0.0480716]
 [0.00166592 0.99988228 0.01525308 0.00021129]
 [0.01882987 -0.01528176 0.99970591 0.00279885]
 [0. 0. 0. 1.]]
baseline norm: 0.0481534768126182 [m]

Gravity vector in target coords: [m/s^2]
[-0.32405859 -9.72962058 1.18232496]

Calibration configuration

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cam0

Camera model: pinhole
Focal length: [363.52606181199894, 362.43000912226285]
Principal point: [303.26053123939386, 236.38284406923117]
Distortion model: radtan
Distortion coefficients: [-0.06086476794988416, 0.017810830123546423, -0.0006258720126578837,
-0.003773156952442771]
Type: aprilgrid
Tags:
Rows: 6
Cols: 6
Size: 0.021 [m]
Spacing 0.0063 [m]

cam1

Camera model: pinhole
Focal length: [366.21470791274123, 366.35745346274797]
Principal point: [308.355206650523, 230.7705237943884]
Distortion model: radtan
Distortion coefficients: [-0.05532584558977291, 0.02645915201582352, -0.004289907393645652,
-0.005375825942818518]
Type: aprilgrid
Tags:
Rows: 6
Cols: 6
Size: 0.021 [m]
Spacing 0.0063 [m]

IMU configuration

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IMU0:

Model: calibrated
Update rate: 200.0

Accelerometer:

Noise density: 0.003651161265343041

Noise density (discrete): 0.051635217798594396

Random walk: 0.00016293434166236685

Gyroscope:

Noise density: 0.0005921311595037176

Noise density (discrete): 0.008373999164738638

Random walk: 1.2772397186168076e-05

T_ib (imu0 to imu0)

[[1. 0. 0. 0.]

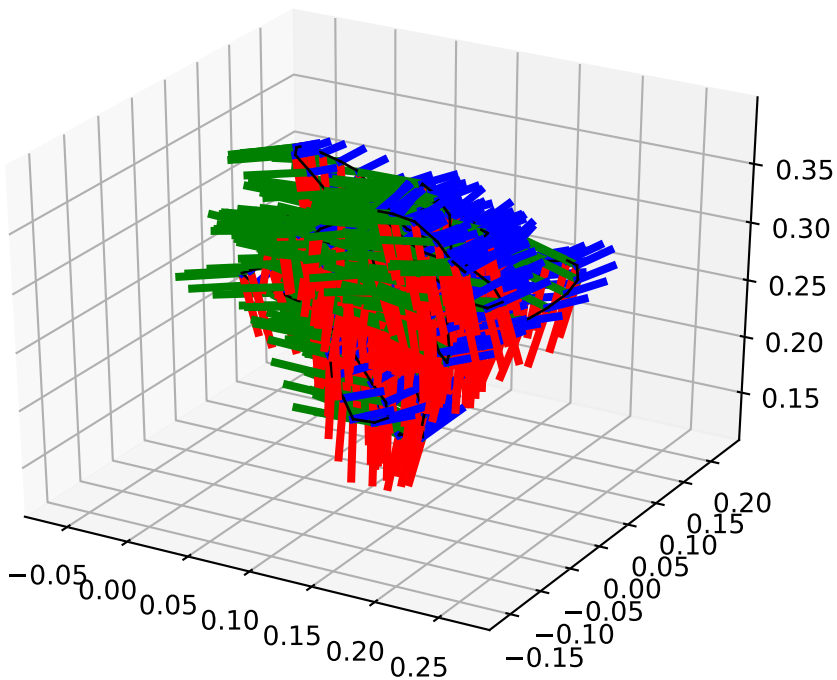
[0. 1. 0. 0.]

[0. 0. 1. 0.]

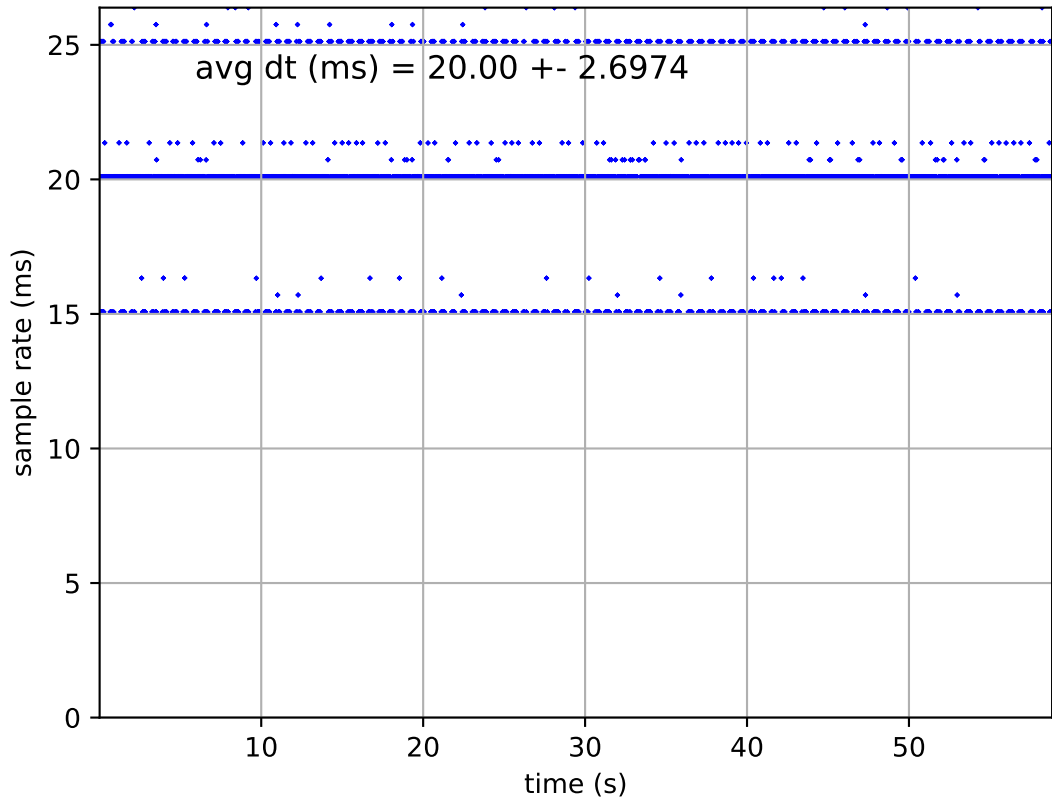
[0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

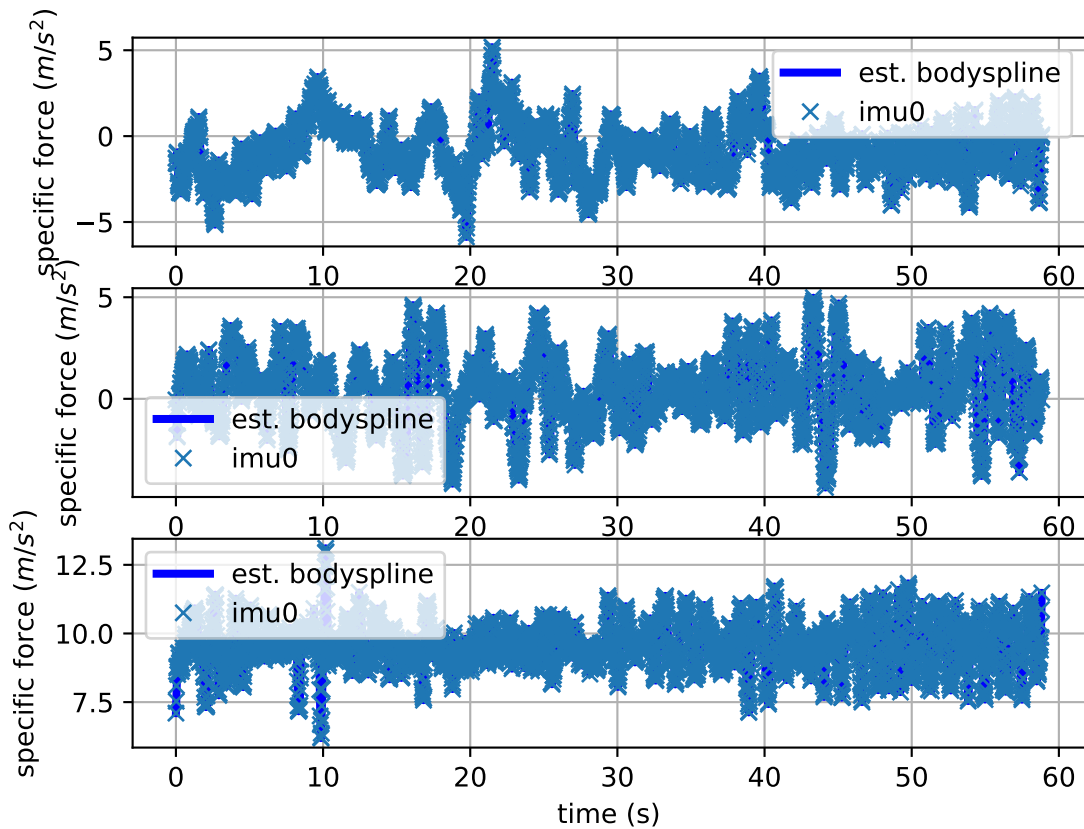
imu0: estimated poses



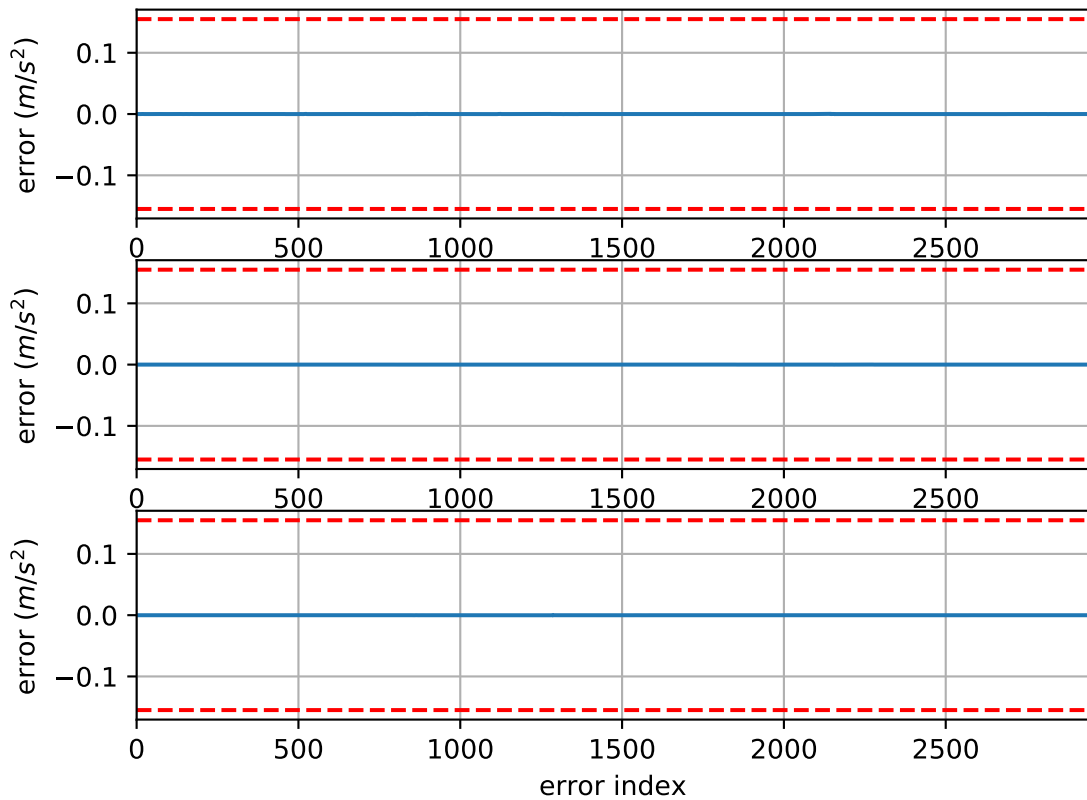
imu0: sample inertial rate



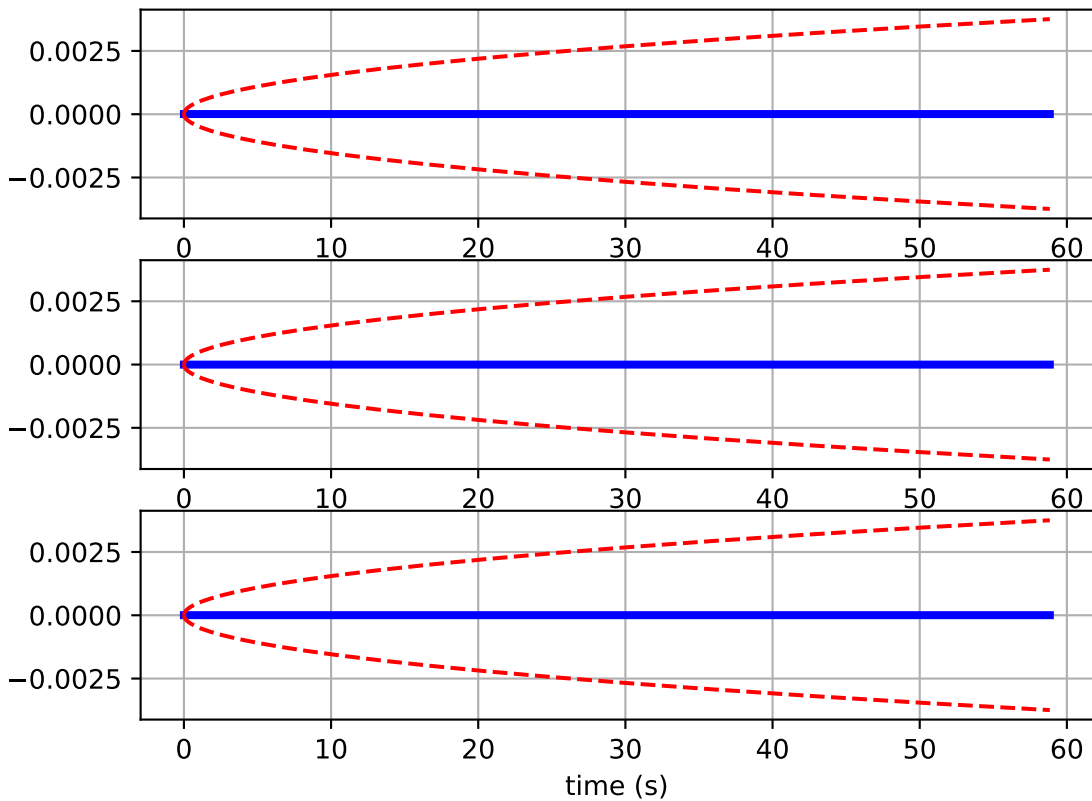
Comparison of predicted and measured specific force (imu0 frame)



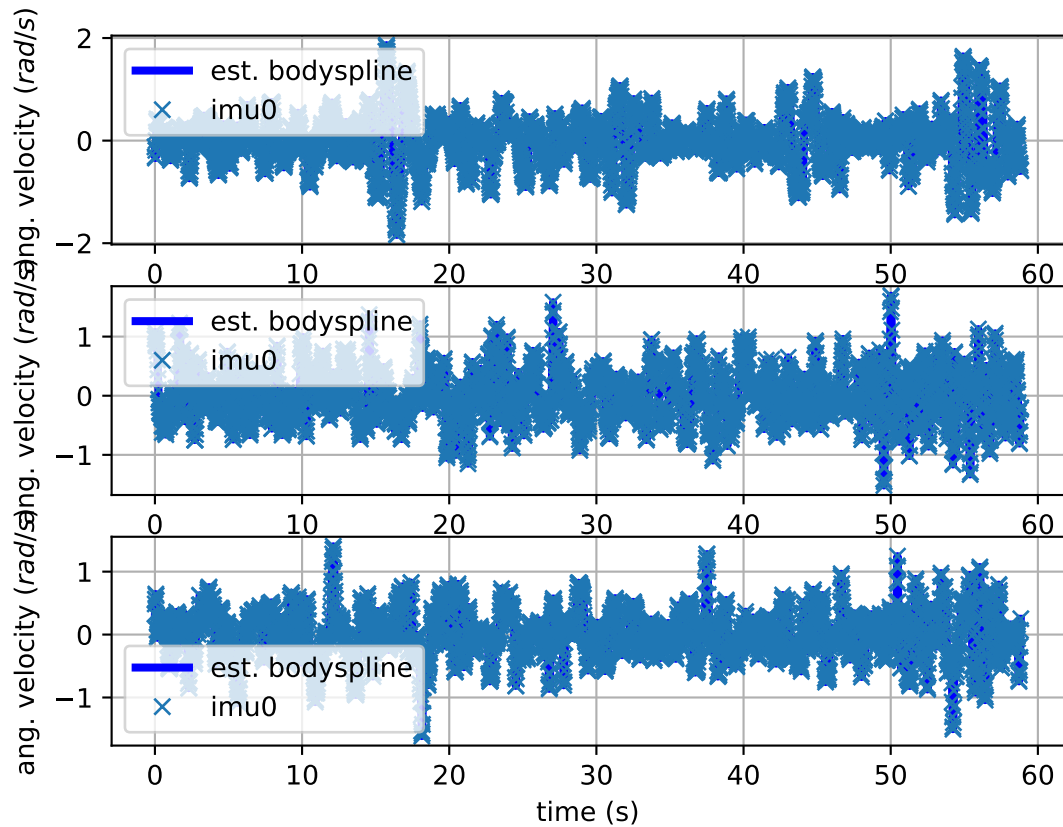
imu0: acceleration error



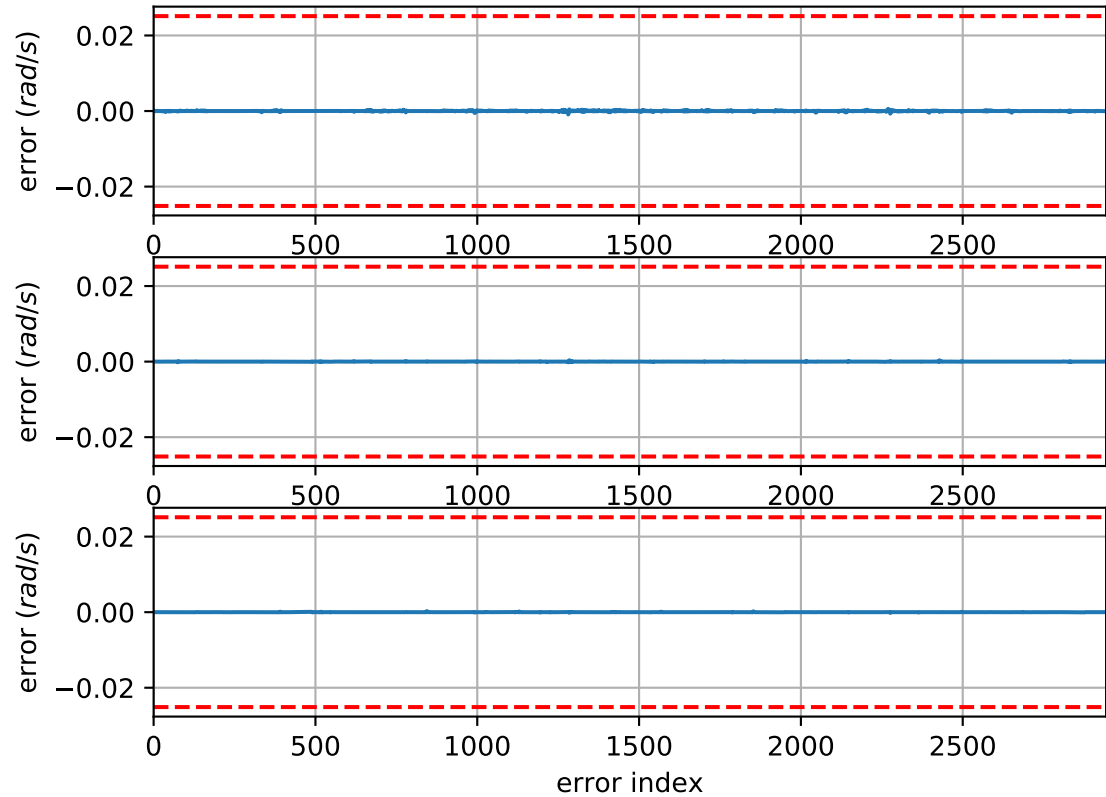
imu0: estimated accelerometer bias (imu frame)



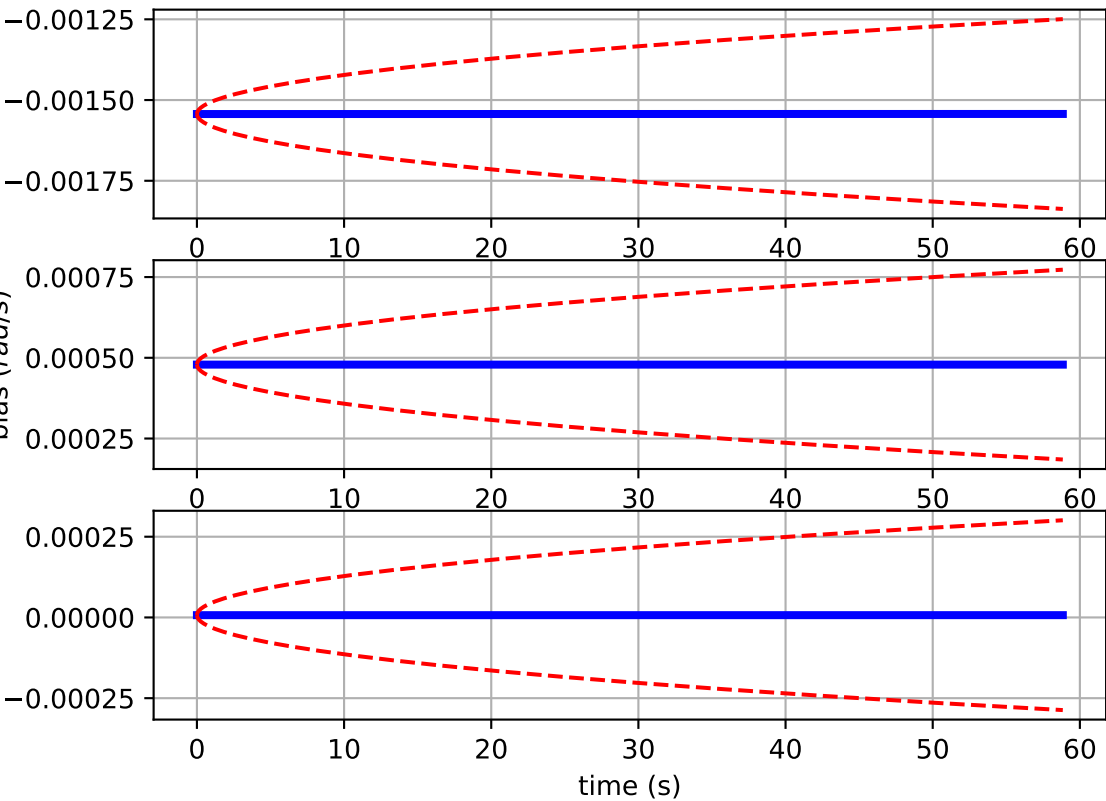
Comparison of predicted and measured angular velocities (body frame)



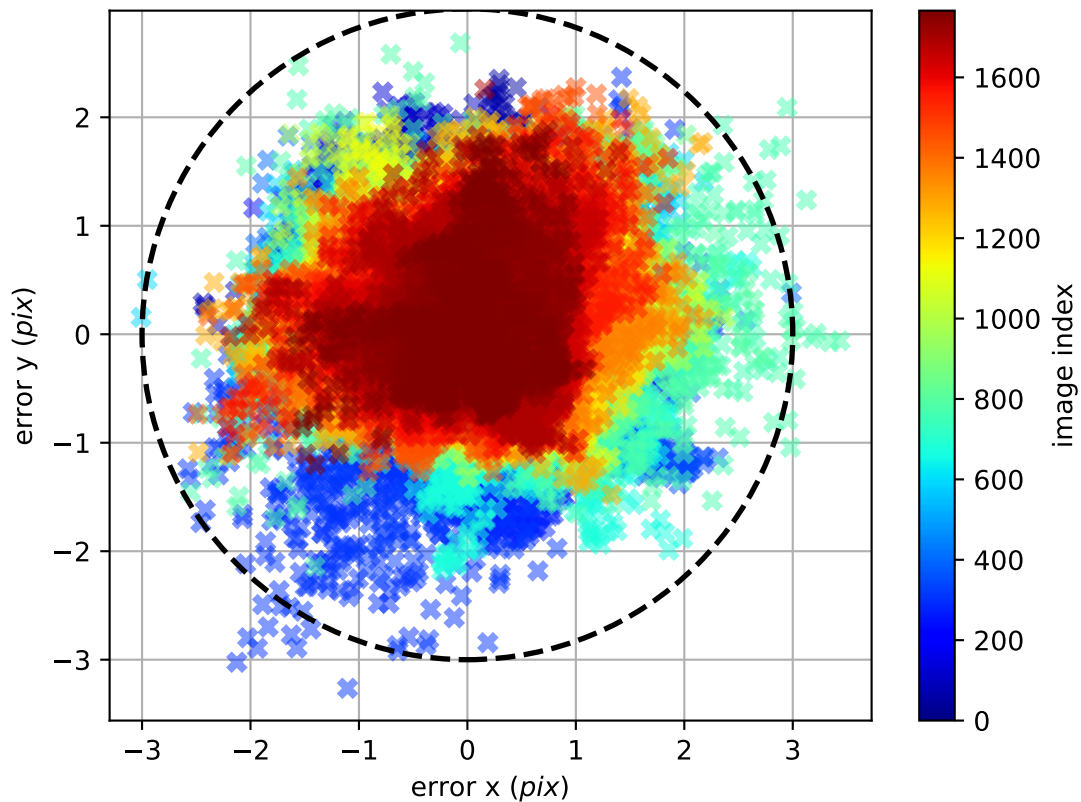
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

