

Calibration results

Normalized Residuals

Reprojection error (cam0): mean 0.129484615226, median 0.124254592268, std: 0.0656031270872
Reprojection error (cam1): mean 0.131034442822, median 0.125472501752, std: 0.0656748342036
Gyroscope error (imu0): mean 0.0955155950479, median 0.0533638445312, std: 0.128866583531
Accelerometer error (imu0): mean 0.890952449106, median 0.275258003847, std: 3.08984879873

Residuals

Reprojection error (cam0) [px]: mean 0.129484615226, median 0.124254592268, std: 0.0656031270872
Reprojection error (cam1) [px]: mean 0.131034442822, median 0.125472501752, std: 0.0656748342036
Gyroscope error (imu0) [rad/s]: mean 0.0135079449935, median 0.00754678726763, std: 0.01822448701
Accelerometer error (imu0) [m/s²]: mean 0.125999703695, median 0.0389273602193, std: 0.43697060763

Transformation (cam0):

T_ci: (imu0 to cam0):

```
[[-0.00284551 -0.99999526  0.00117425 -0.0046842 ]  
 [-0.04775619 -0.00130881 -0.99885816 -0.12535611]  
 [ 0.99885497  0.00278619 -0.04775968 -0.44608711]  
 [ 0.        0.        0.        1.      ]]
```

T_ic: (cam0 to imu0):

```
[[-0.00284551 -0.04775619  0.99885497  0.43960312]  
 [-0.99999526 -0.00130881  0.00278619 -0.00360536]  
 [ 0.00117425 -0.99885816 -0.04775968 -0.14651245]  
 [ 0.        0.        0.        1.      ]]
```

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

0.00151792736412

Transformation (cam1):

T_ci: (imu0 to cam1):

```
[ 0.      0.      0.      1.      ]]
```

T_ic: (cam1 to imu0):

```
[[ 0.00275066 -0.0475027  0.99886732  0.43970065]
[-0.99999554 -0.00129442  0.00269221 -0.07654247]
[ 0.00116507 -0.99887027 -0.04750605 -0.14644542]
[ 0.      0.      0.      1.      ]]
```

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

```
0.00151958133688
```

Baselines:

Baseline (cam0 to cam1):

```
[[ 1.      0.00001371 -0.0000943 -0.07293713]
[-0.00001368  0.99999997  0.00025382 -0.00002282]
[ 0.00009431 -0.00025381  0.99999996  0.00010213]
[ 0.      0.      0.      1.      ]]
baseline norm: 0.0729372061385 [m]
```

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

```
[ 0.02385094 -9.80651471  0.01110528]
```

Calibration configuration

=====

cam0

Camera model: pinhole

Focal length: [274.97786132462113, 275.08073962025327]

Principal point: [274.7985295392873, 249.62606513552768]

Distortion model: equidistant

Distortion coefficients: [0.3399447009395237, 0.07618041148579728, 0.1706656675408842, -0.04964407]

Type: aprilgrid

Tags:

Spacing 0.0264 [m]

cam1

Camera model: pinhole

Focal length: [275.00955843876915, 275.1078099056965]

Principal point: [274.7939065008416, 249.56320911813327]

Distortion model: equidistant

Distortion coefficients: [0.3391655973480746, 0.08927569971768065, 0.13368330284997704, -0.0173415]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.088 [m]

Spacing 0.0264 [m]

IMU configuration

=====

IMU0:

Model: calibrated

Update rate: 200.0

Accelerometer:

 Noise density: 0.01

 Noise density (discrete): 0.141421356237

 Random walk: 0.01

Gyroscope:

 Noise density: 0.01

 Noise density (discrete): 0.141421356237

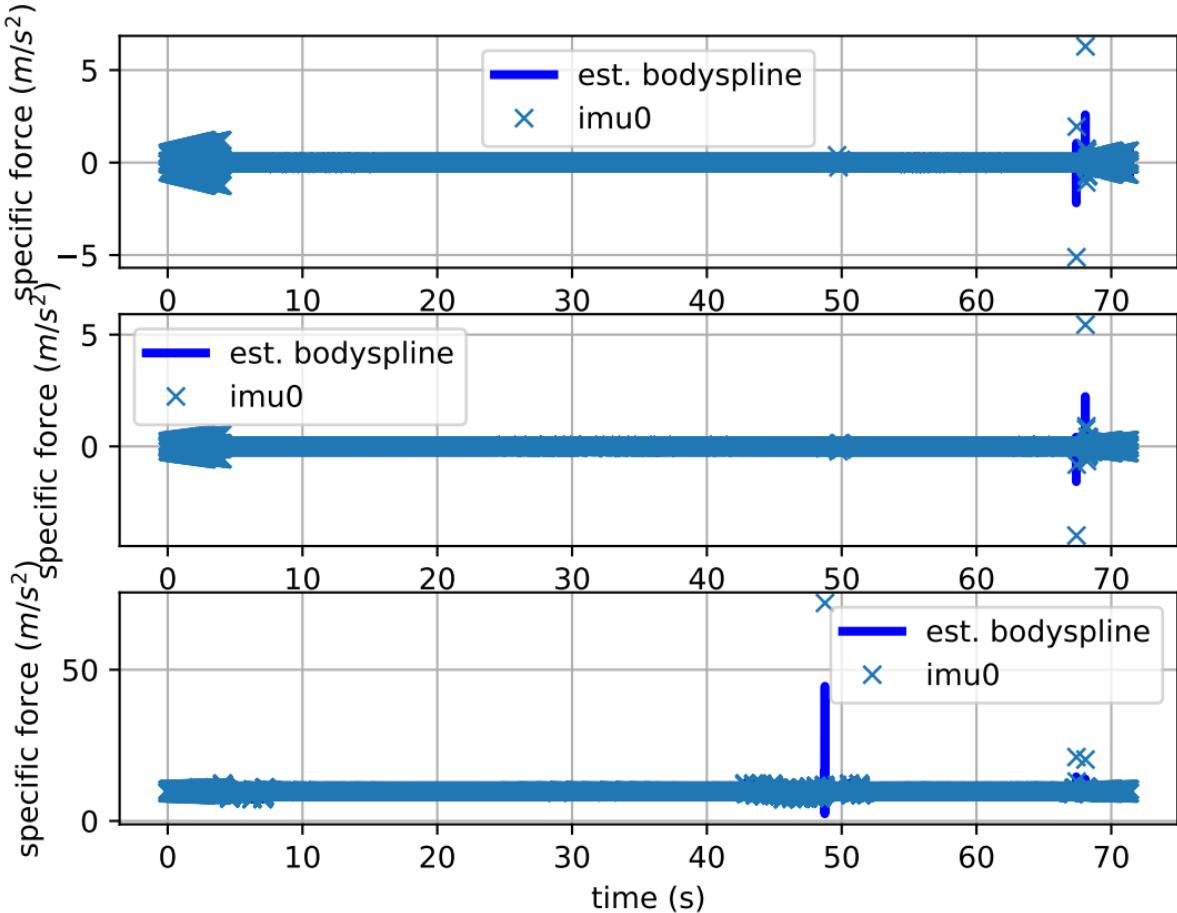
 Random walk: 0.01

T_i_b

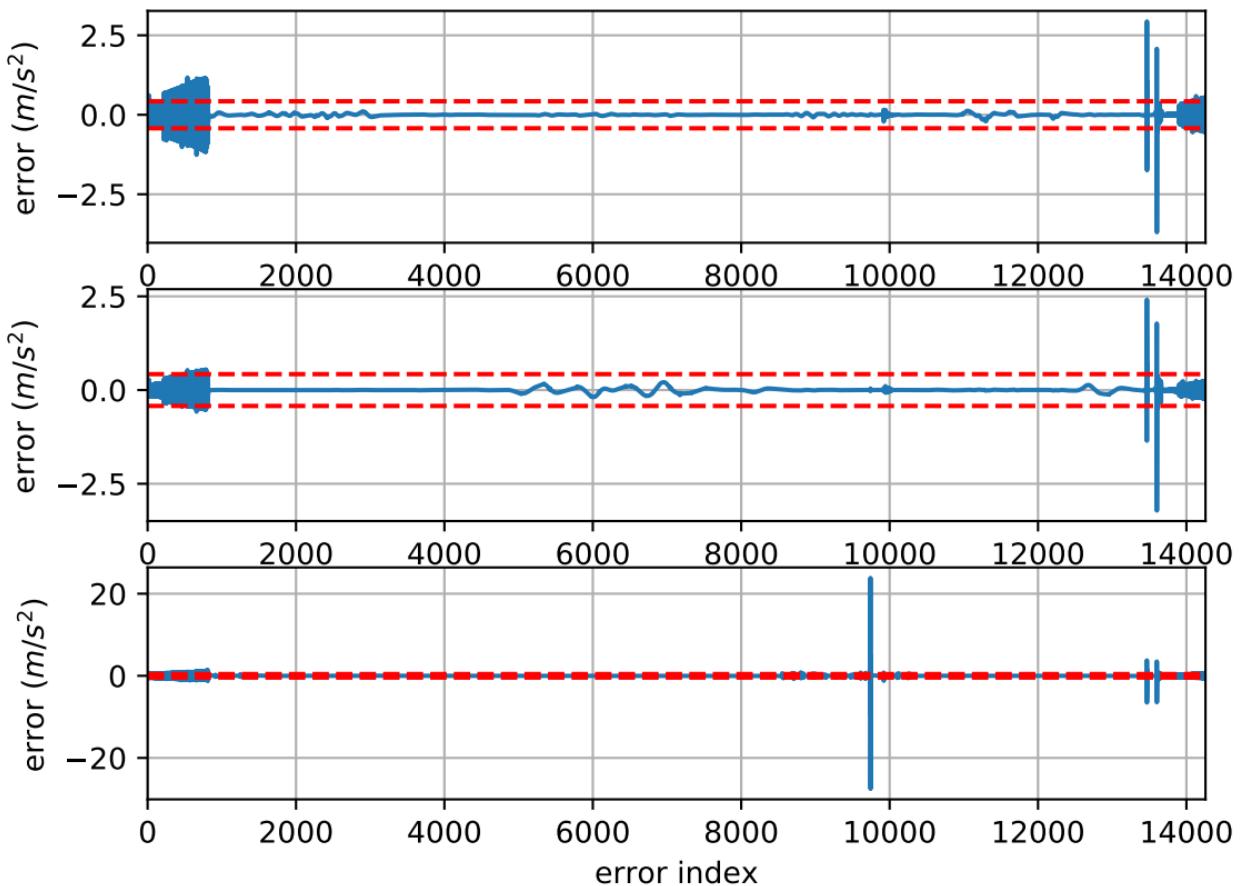
[[1. 0. 0. 0.]

[0. 1. 0. 0.]

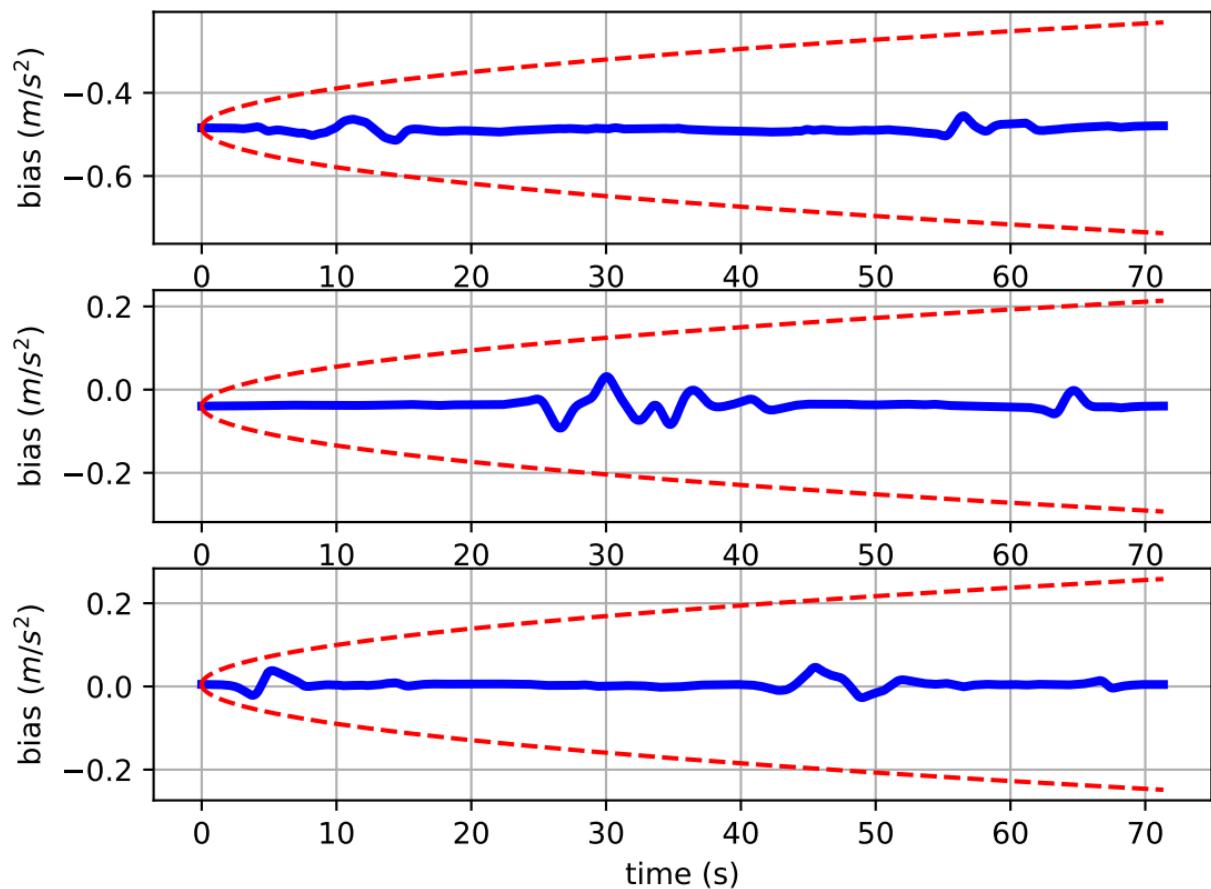
Comparison of predicted and measured specific force (imu0 frame)



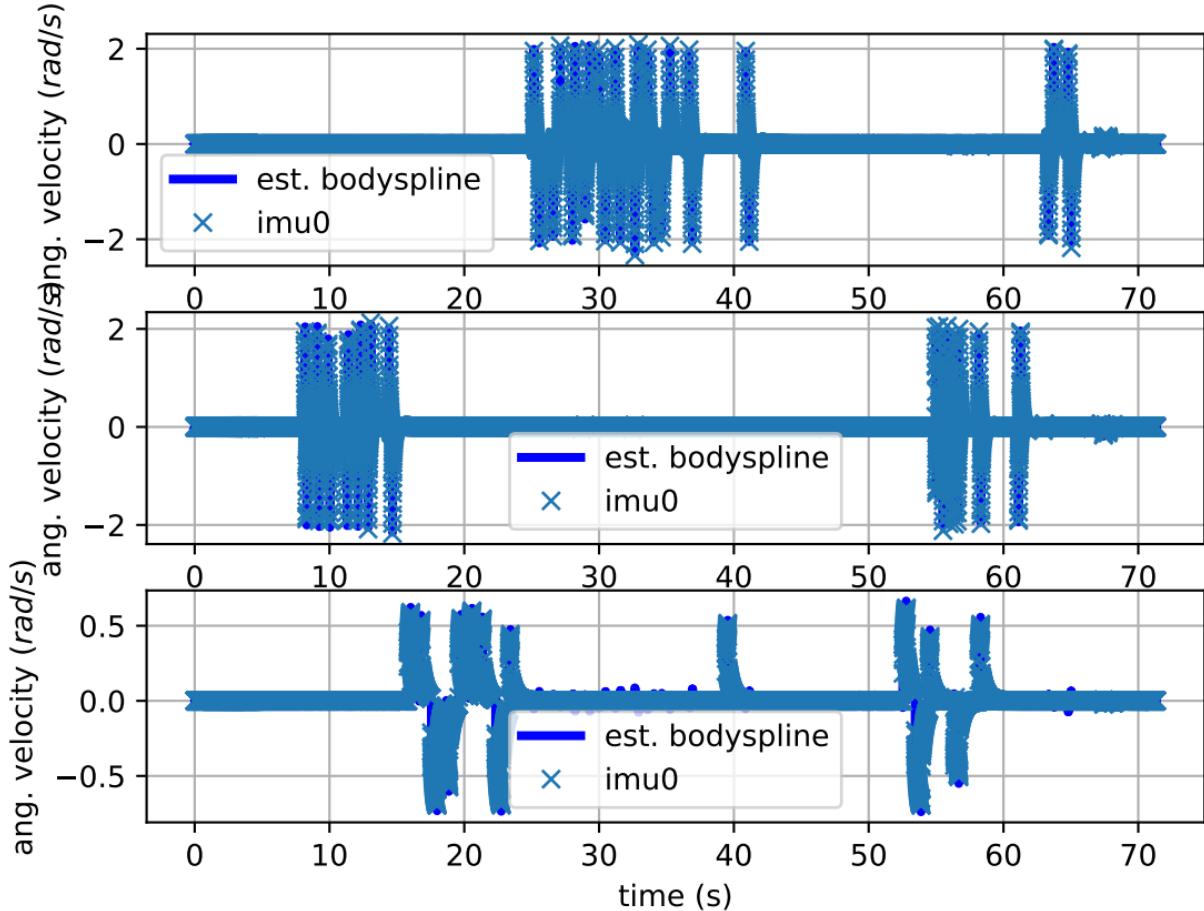
imu0: acceleration error



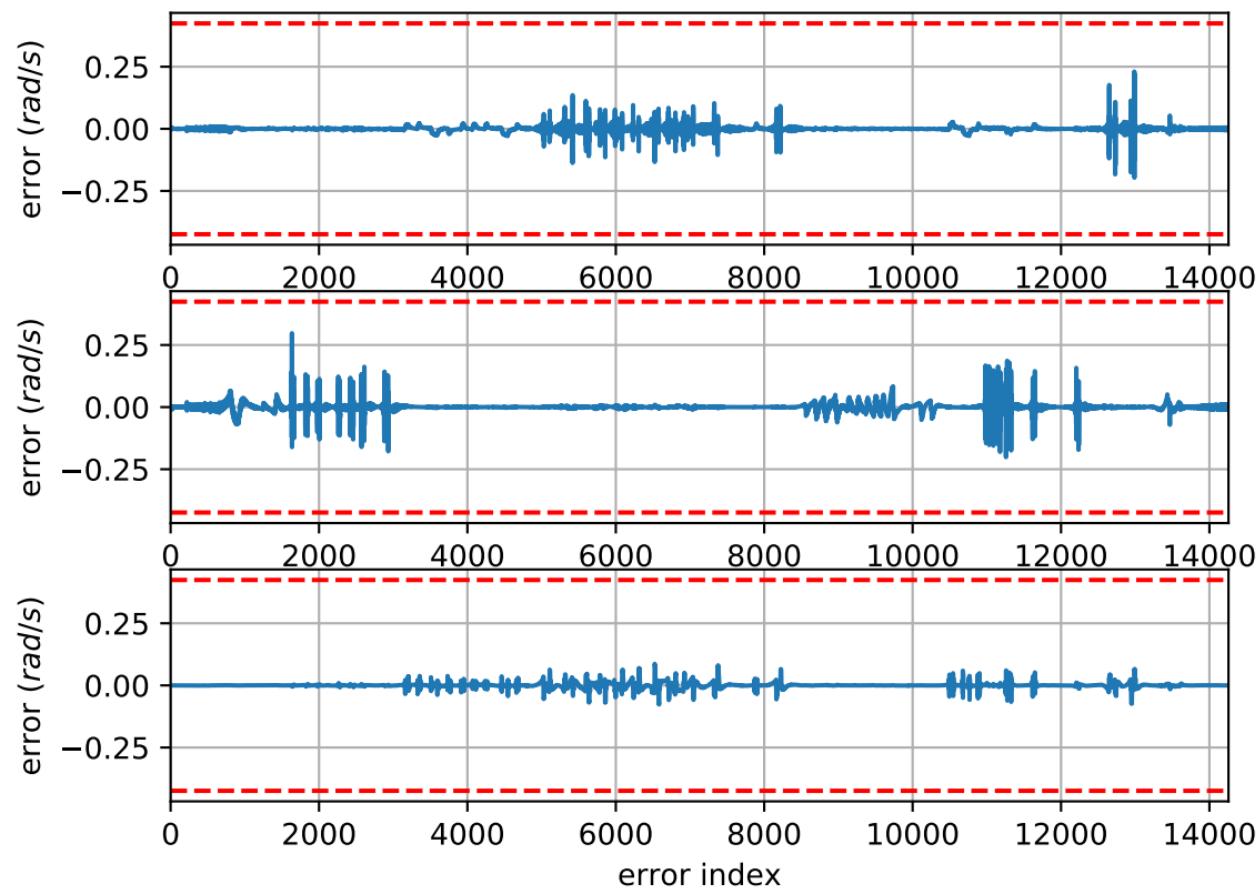
imu0: estimated accelerometer bias (imu frame)



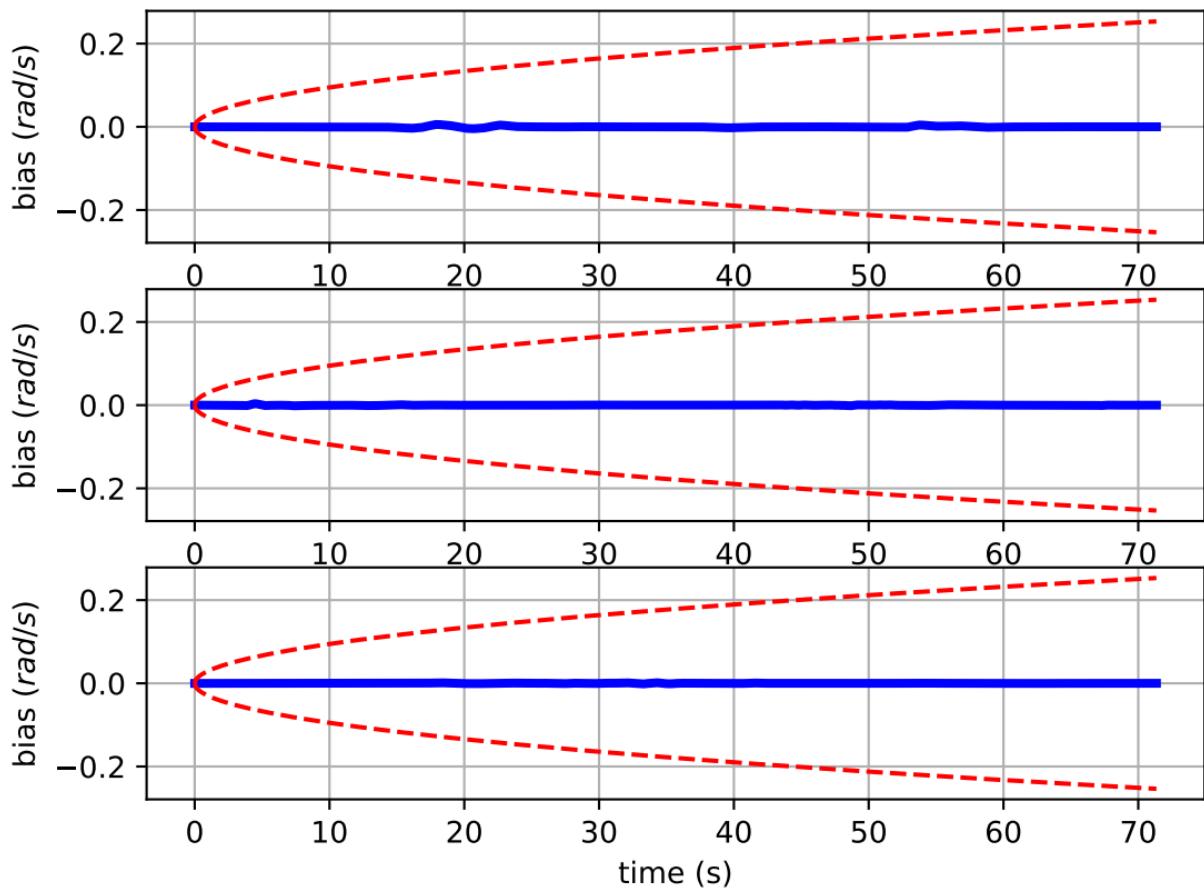
Comparison of predicted and measured angular velocities (body frame)



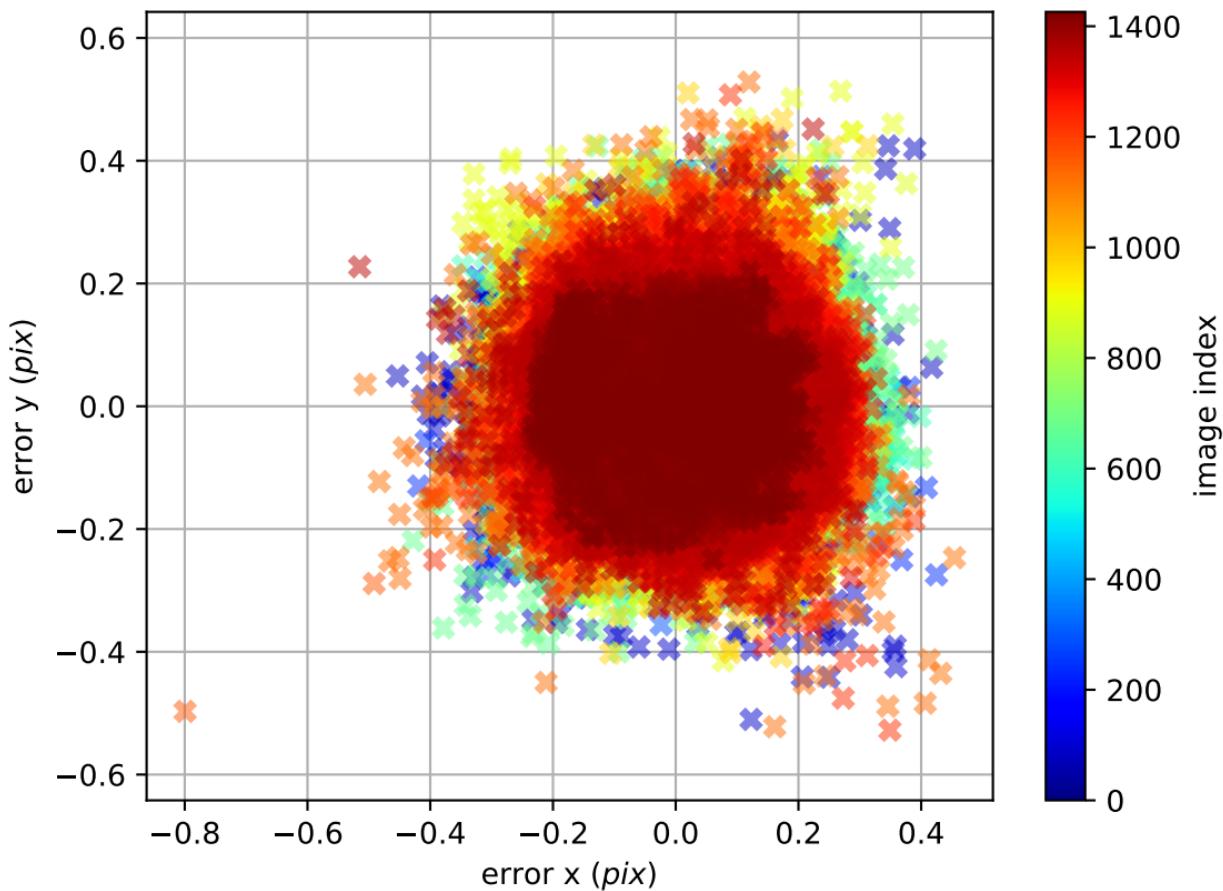
imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors



cam1: reprojection errors

