Calibration results
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Normalized Residuals

Reprojection error (cam0): mean 0.122853660315, median 0.117435956376, std: 0.0615678730458
Reprojection error (cam1): mean 0.122779367241, median 0.116077076383, std: 0.06449694756
Gyroscope error (imu0): mean 0.00102807227232, median 0.000510665059574, std: 0.0022425651212
Accelerometer error (imu0): mean 0.000103236086088, median 5.09424519518e-05, std: 0.00024689099

Residuals

Reprojection error (cam0) [px]: mean 0.122853660315, median 0.117435956376, std: 0.0615678730458
Reprojection error (cam1) [px]: mean 0.122779367241, median 0.116077076383, std: 0.06449694756
Gyroscope error (imu0) [rad/s]: mean 3.44648137476e-05, median 1.71193958242e-05, std: 7.51791399
Accelerometer error (imu0) [m/s^2]: mean 2.88211479433e-05, median 1.42219644306e-05, std: 6.892630

Transformation (cam0):

T_ci: (imu0 to cam0):
[[-0.02567454 -0.99942333 -0.02222218 -0.00105819]
 [-0.02034526 0.0227473 -0.99953421 0.0001415]
 [0.9994633 -0.02521046 -0.02091756 0.00007849]
 [0.   0.   0.   1.   ]]

T_ic: (cam0 to imu0):
[[-0.02567454 -0.02034526 0.9994633 -0.00010274]
 [-0.99942333 0.0227473 -0.02521046 -0.00105882]
 [-0.02222218 -0.99953421 -0.02091756 0.00011956]
 [0.   0.   0.   1.   ]]

timeshift cam0 to imu0: [s] (t_imu = t_cam + shift)
0.00303393038126

Transformation (cam1):

T_ci: (imu0 to cam1):

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

T_ic:  (cam1 to imu0):
[[-0.02268843 -0.01900211  0.99956198 -0.00290856]
 [-0.99952435  0.02132094 -0.02228225 -0.12107101]
 [-0.02088819 -0.99959209 -0.01947681 -0.00251914]
 [ 0.          0.          0.          1.        ]]

timeshift cam1 to imu0: [s] (t_imu = t_cam + shift)
-0.00223280370025

Baselines:
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Baseline (cam0 to cam1):
[[ 0.99999465 -0.00139642  0.00295915 -0.12007389]
 [ 0.00139234  0.99999808  0.0013796  -0.00013217]
 [-0.00296107 -0.00137548  0.99999467  0.00007906]
 [ 0.          0.          0.          1.        ]]
baseline norm:  0.120073985292 [m]


Gravity vector in target coords: [m/s^2]
[ 9.80500832  0.14322236  0.09860122]


Calibration configuration
=========================

cam0
-----
  Camera model: pinhole
  Focal length: [689.4312370164555, 688.9893904487758]
  Principal point: [624.3763728136926, 356.7418574117534]
  Distortion model: radtan
  Distortion coefficients: [0.03725052823495132, -0.05378659517448043, 0.003149783479596222, 0.00389
  Type: checkerboard
  Rows
```

    Count: 5
    Distance: 0.03 [m]

cam1

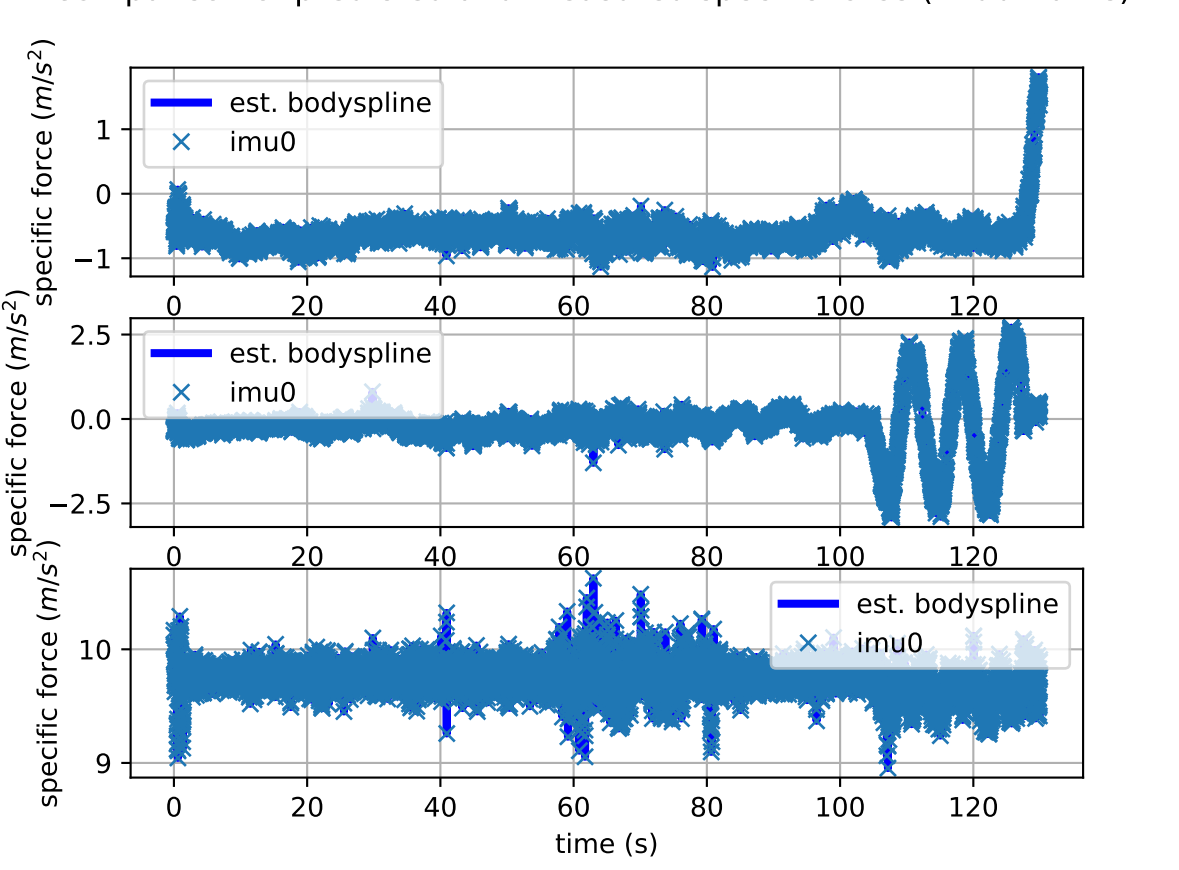
  Camera model: pinhole
  Focal length: [691.2053253392289, 690.1347839096699]
  Principal point: [622.4553132282573, 356.09665071845933]
  Distortion model: radtan
  Distortion coefficients: [0.017271676668180726, -0.00702613583820903, 0.0026729824408928335, 0.004
  Type: checkerboard
  Rows
    Count: 7
    Distance: 0.03 [m]
  Cols
    Count: 5
    Distance: 0.03 [m]

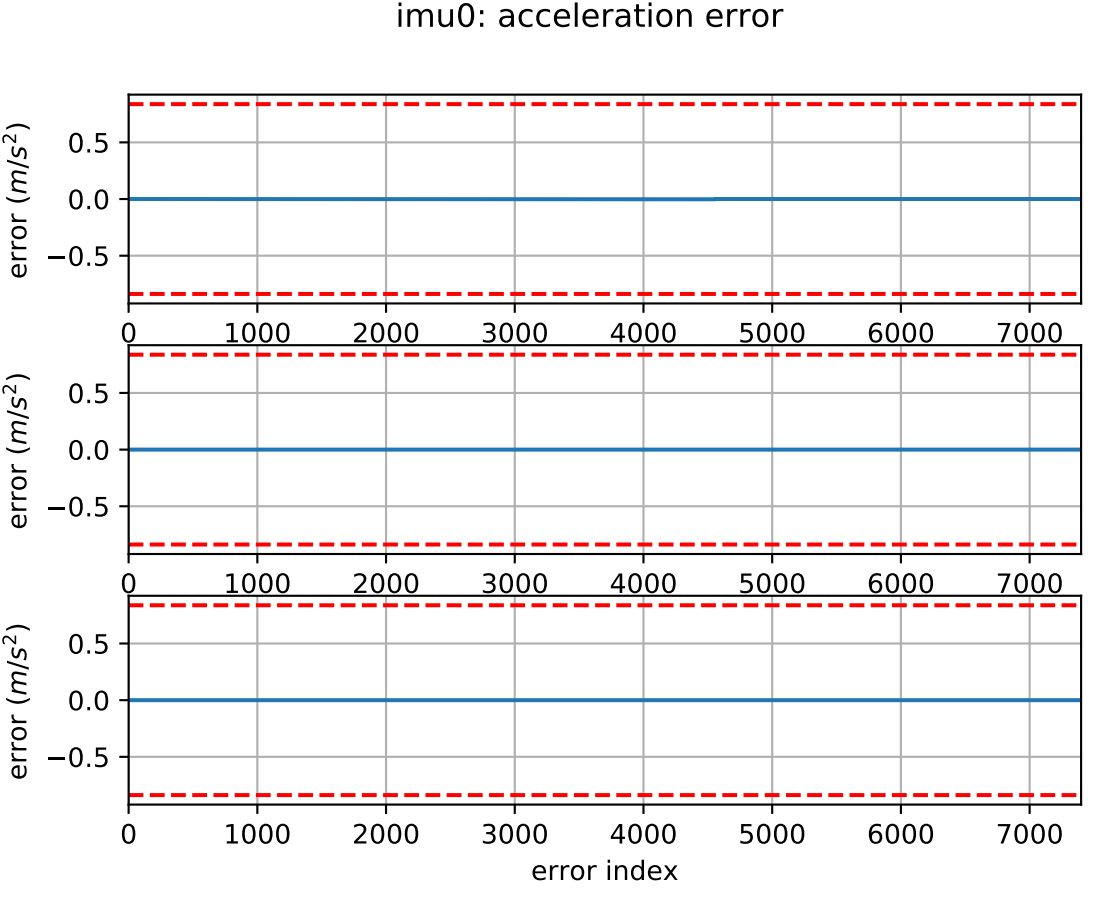
IMU configuration
==================

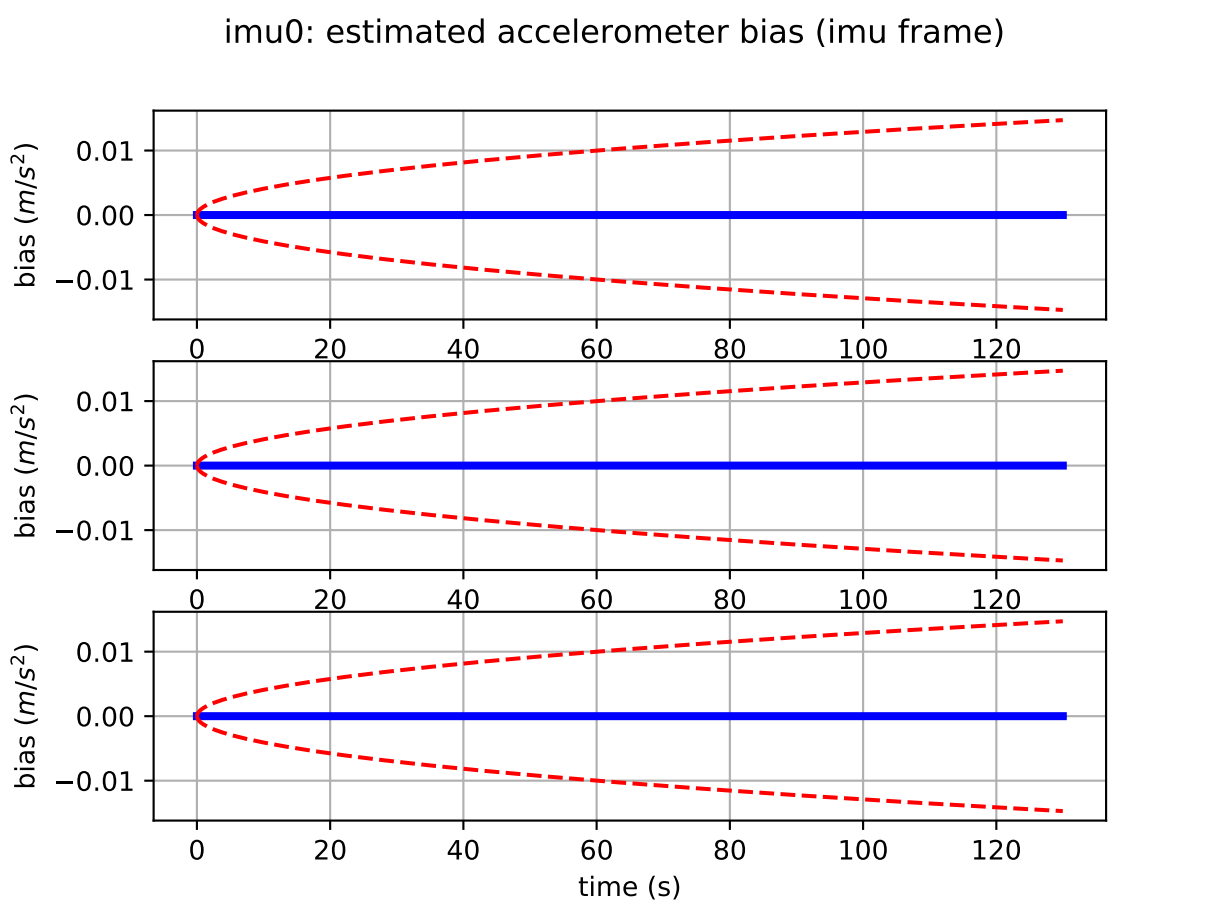
IMU0:

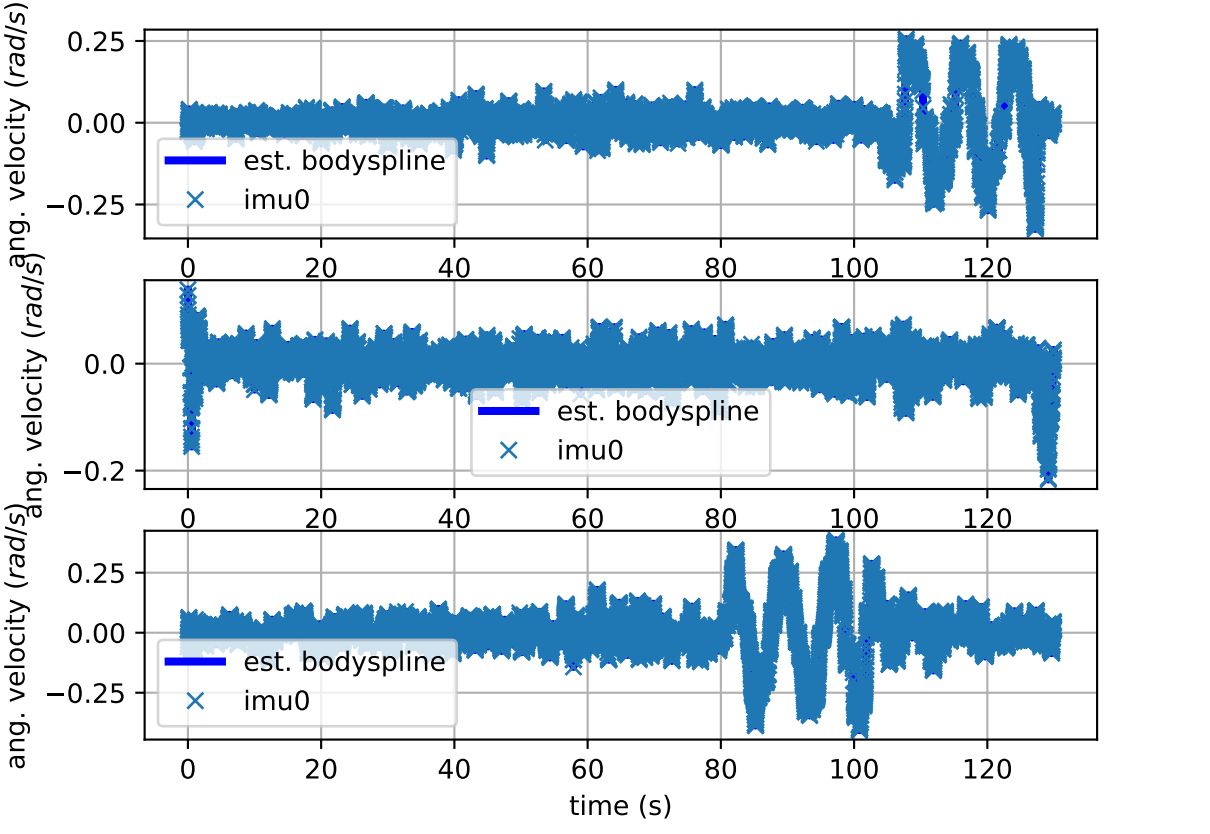
  Model: scale-misalignment
  Update rate: 200.0
  Accelerometer:
    Noise density: 0.0197407998738
    Noise density (discrete): 0.279177069137
    Random walk: 0.000430157819128
  Gyroscope:
    Noise density: 0.00237048543857
    Noise density (discrete): 0.0335237265663
    Random walk: 2.66852241555e-05
  T_i_b

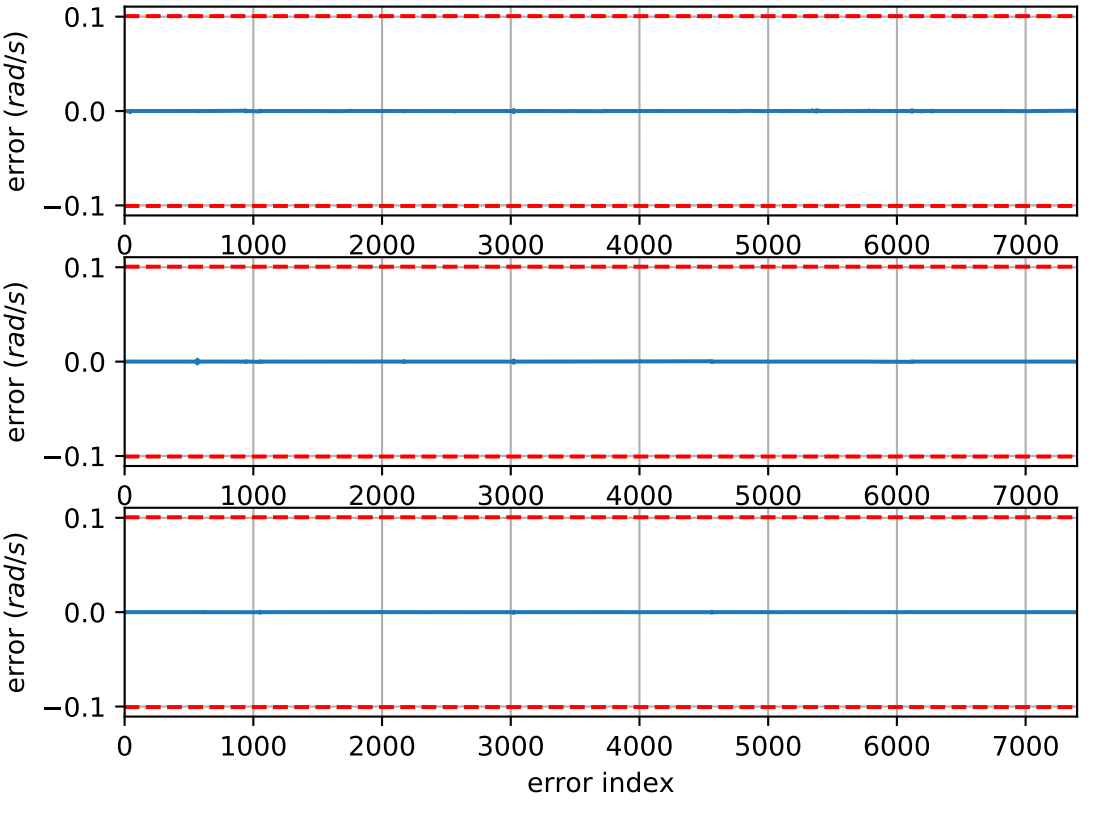
```
   [ 0.  0.  0.  1.]]
time offset with respect to IMU0: 0.0 [s]
Gyroscope:
  M:
    [[ 1.017748    0.          0.        ]
     [-0.00901818  0.83840192  0.        ]
     [-0.00616427  0.01210449  0.95906589]]
  A [(rad/s)/(m/s^2)]:
    [[ 0.01127416  0.00113586  0.00060116]
     [-0.0149953   0.00026911 -0.00060307]
     [-0.01209371  0.0009078  -0.00064911]]
  C_gyro_i:
    [[ 0.99968353 -0.00057389  0.02514964]
     [-0.00024868  0.99946546  0.03269147]
     [-0.02515495 -0.03268738  0.99914902]]
Accelerometer:
  M:
    [[ 1.00004572  0.          0.        ]
     [-0.00113028  1.00179504  0.        ]
     [-0.00030393 -0.0008442   1.00917305]]
```

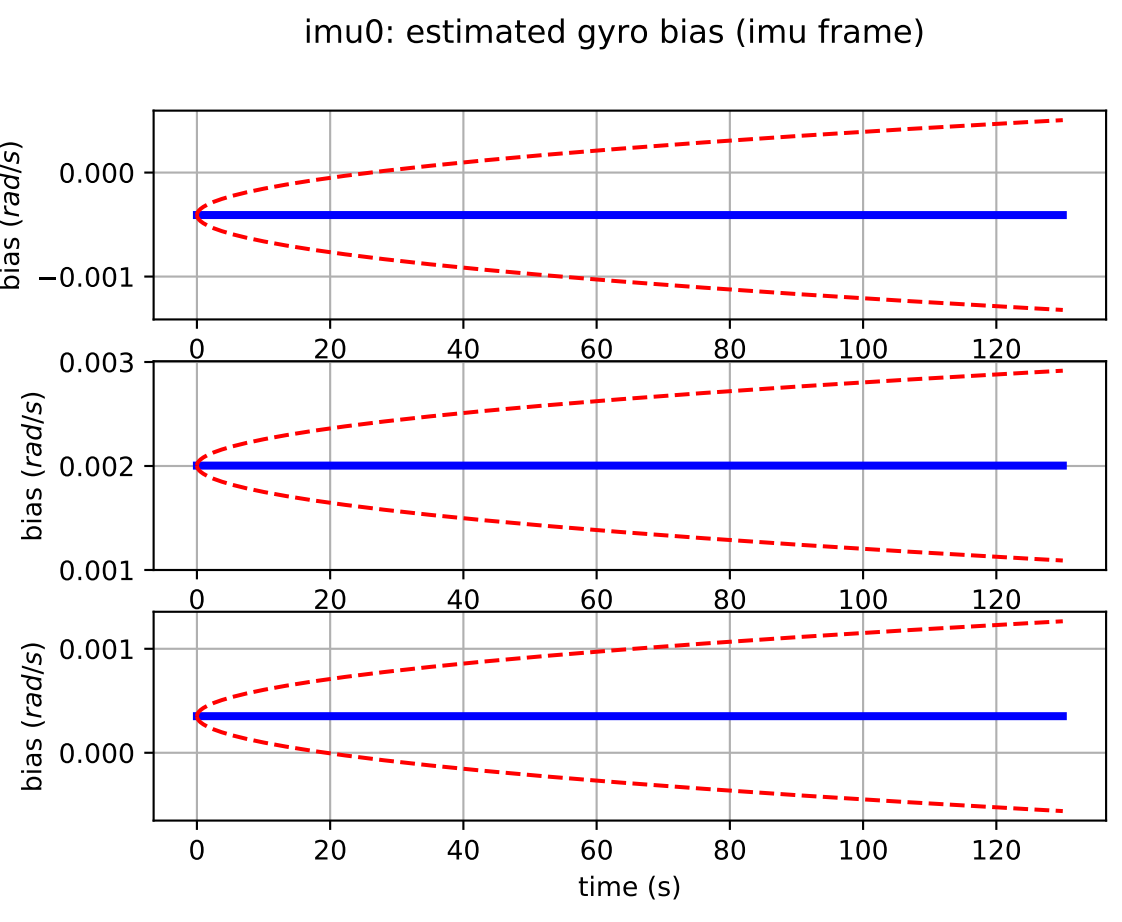

Comparison of predicted and measured specific force (imu0 frame)
est. bodyspline
imu0
specific force (m/s^2)
time (s)

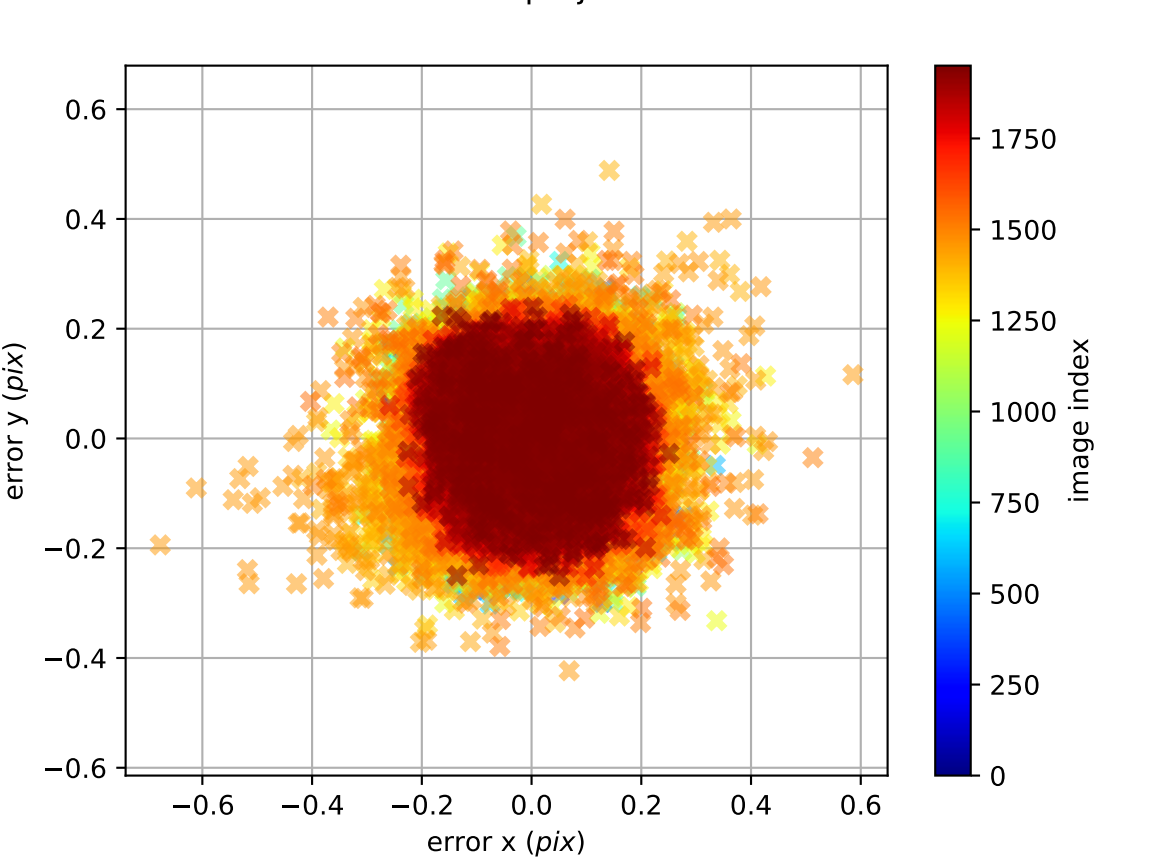

imu0: acceleration error
error (m/s^2)
0.5
0.0
−0.5
0
1000
2000
3000
4000
5000
6000
7000
error index

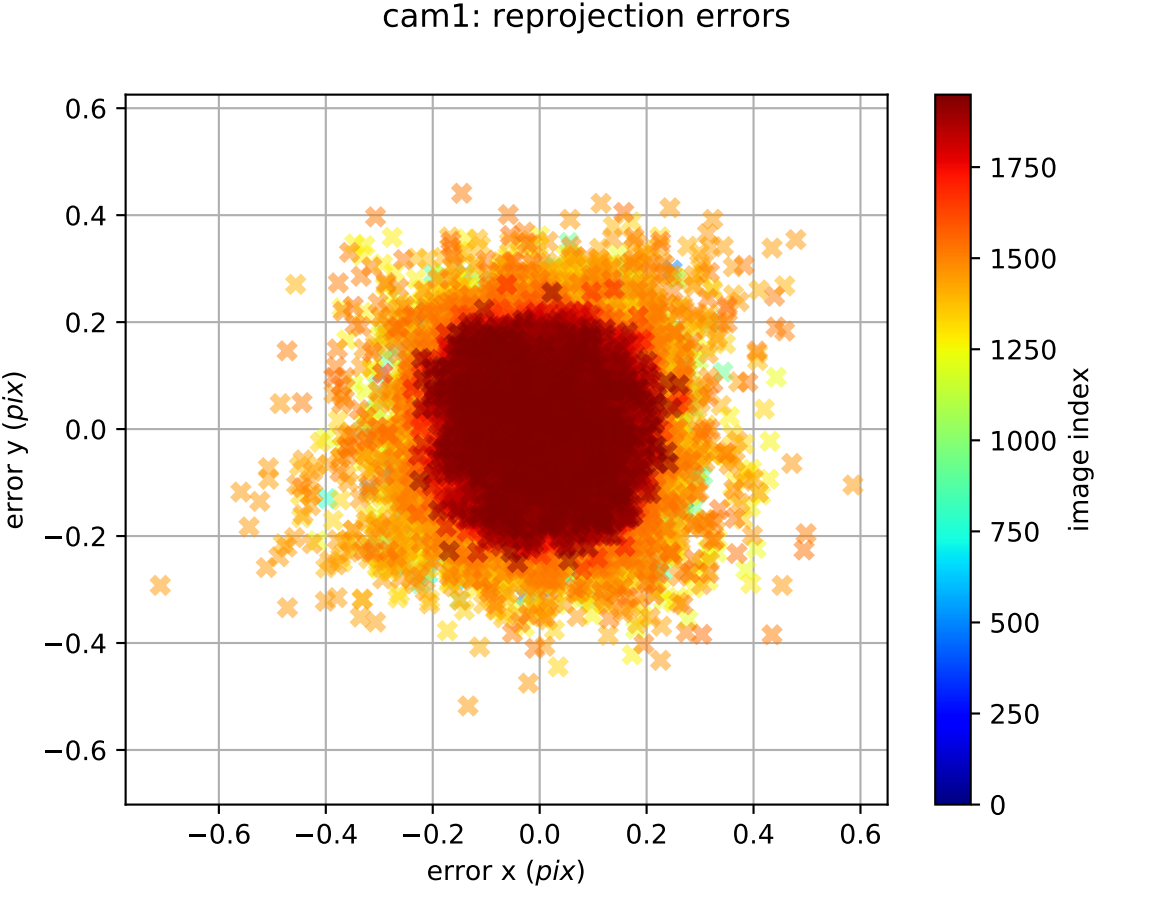

imu0: estimated accelerometer bias (imu frame)
bias (m/s^2)
0.01
0.00
−0.01
0
20
40
60
80
100
120
time (s)


Comparison of predicted and measured angular velocities (body frame)
ang. velocity (rad/s)
ang. velocity (rad/s)
ang. velocity (rad/s)
est. bodyspline
imu0
est. bodyspline
imu0
est. bodyspline
imu0
0.25
0.00
−0.25
0.0
−0.2
0.25
0.00
−0.25
0
20
40
60
80
100
120
time (s)


imu0: angular velocities error
error (rad/s)
0.1
0.0
−0.1
0
1000
2000
3000
4000
5000
6000
7000
error index


imu0: estimated gyro bias (imu frame)
bias (rad/s)
0.000
−0.001
0
20
40
60
80
100
120
bias (rad/s)
0.003
0.002
0.001
0
20
40
60
80
100
120
bias (rad/s)
0.001
0.000
0
20
40
60
80
100
120
time (s)


cam0: reprojection errors
error x (pix)
error y (pix)
image index
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
1750
1500
1250
1000
750
500
250
0


cam1: reprojection errors
error x (pix)
error y (pix)
image index
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
1750
1500
1250
1000
750
500
250
0