Calibration results
==========
Normalized Residuals

Reprojection error (cam0): mean 0.213184734717, median 0.102914063073, std: 0.713107026704
Gyroscope error (imu0): mean 2.51027531261, median 2.43086714201, std: 0.918108274642
Accelerometer error (imu0): mean 32.2569723633, median 32.3757196116, std: 2.52412779699

Residuals

Reprojection error (cam0) [px]: mean 0.213184734717, median 0.102914063073, std: 0.713107026704
Gyroscope error (imu0) [rad/s]: mean 0.000814580802694, median 0.000788812963199, std: 0.0002979
Accelerometer error (imu0) [m/s^2]: mean 1.07952477413, median 1.08349881717, std: 0.0844734731841

Transformation (cam0):

T_ci: (imu0 to cam0):
[[0.00296363 -0.99999161 -0.002827   0.06091926]
 [0.99999561 0.00296381 -0.00005937 0.0005695]
 [0.00006775 -0.00282681 0.999996   -0.09977041]
 [0.   0.   0.   1.   ]]

T_ic: (cam0 to imu0):
[[0.00296363 0.99999561 0.00006775 -0.00074328]
 [-0.99999161 0.00296381 -0.00282681 0.06063503]
 [-0.002827   -0.00005937 0.999996   0.09994226]
 [0.   0.   0.   1.   ]]

timeshift cam0 to imu0: [s] (t_imu = t_cam + shift)
0.00386948748159722

Gravity vector in target coords: [m/s^2]
[-0.03813789 9.80647583 -0.00047999]

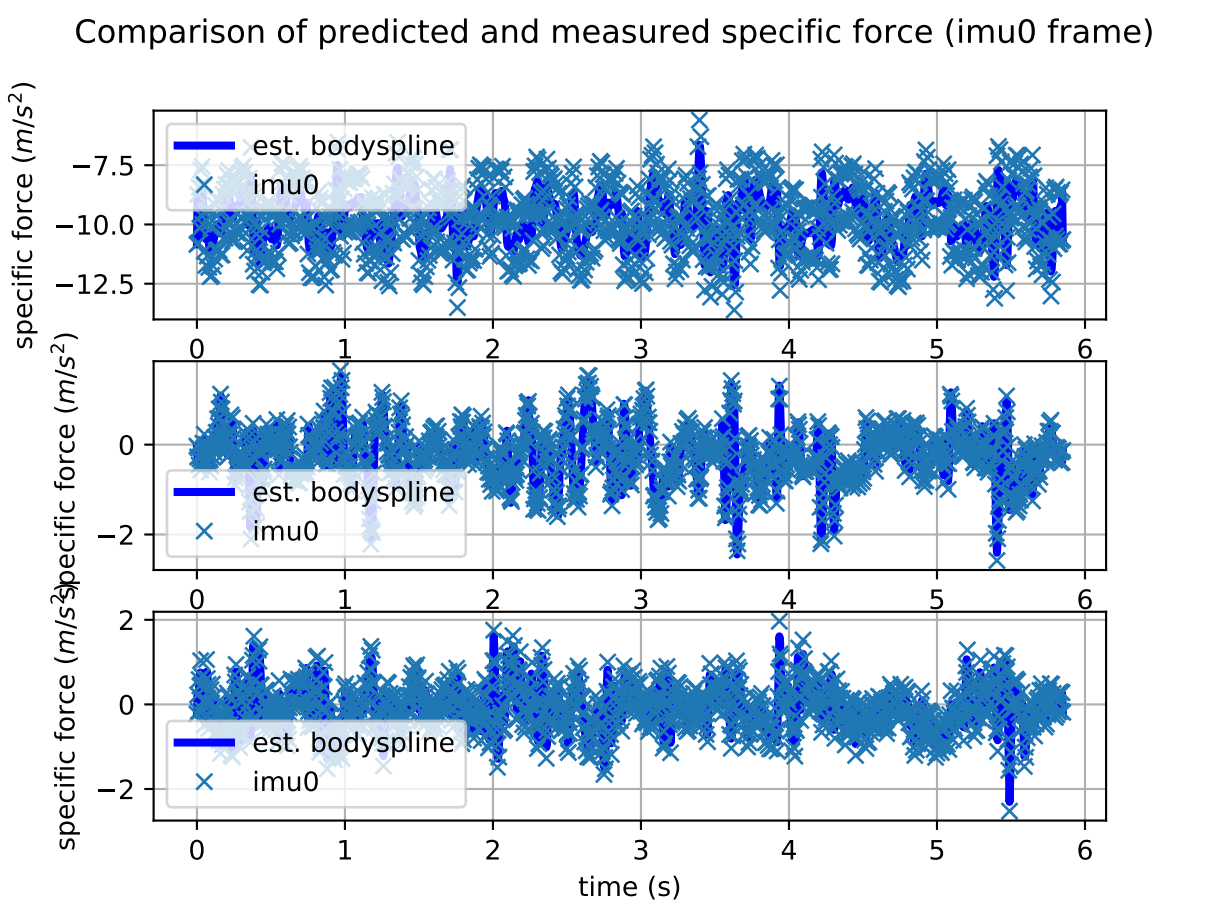
Calibration configuration

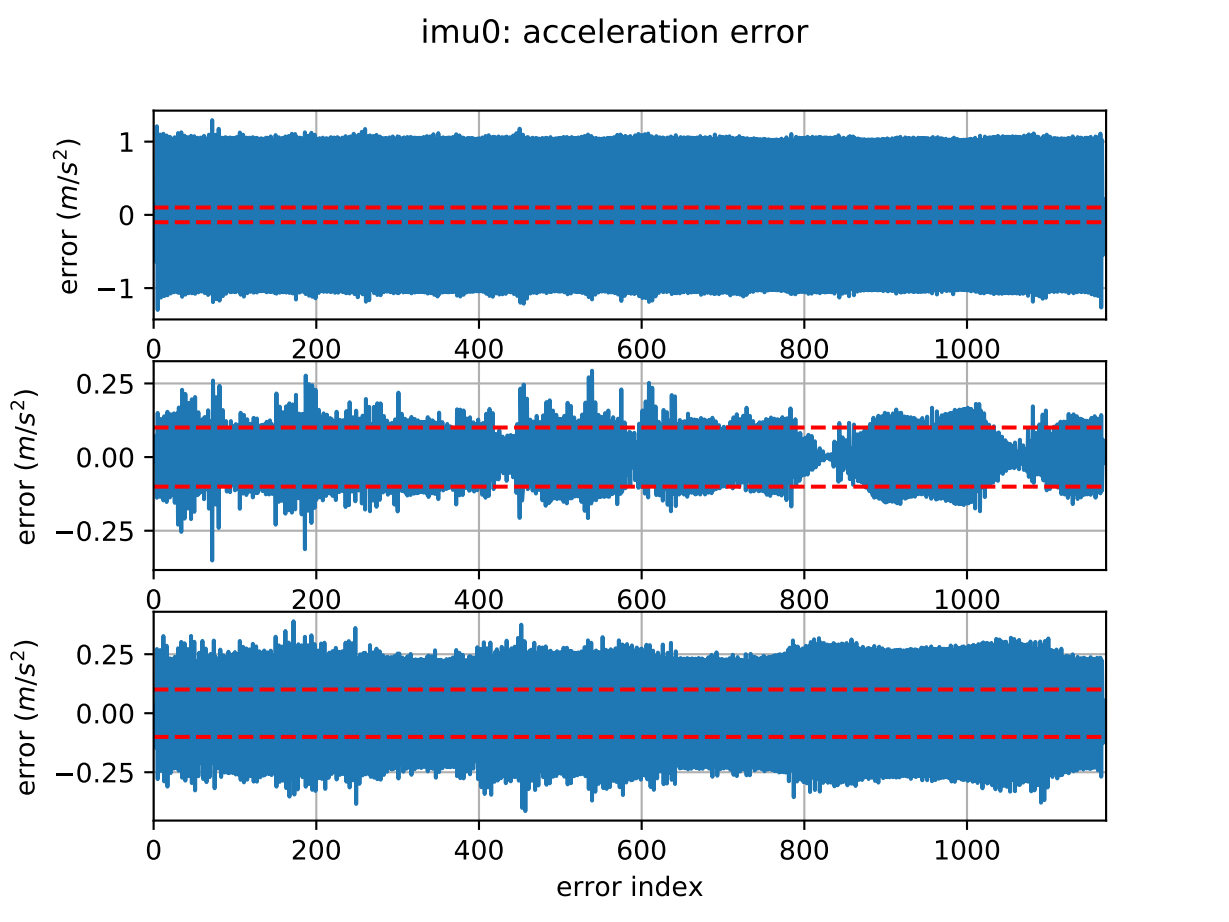
  Camera model: pinhole
  Focal length: [585.7561, 585.7561]
  Principal point: [320.5, 240.5]
  Distortion model: radtan
  Distortion coefficients: [0.0, 0.0, 0.0, 0.0]
  Type: checkerboard
  Rows
    Count: 6
    Distance: 0.01 [m]
  Cols
    Count: 7
    Distance: 0.01 [m]

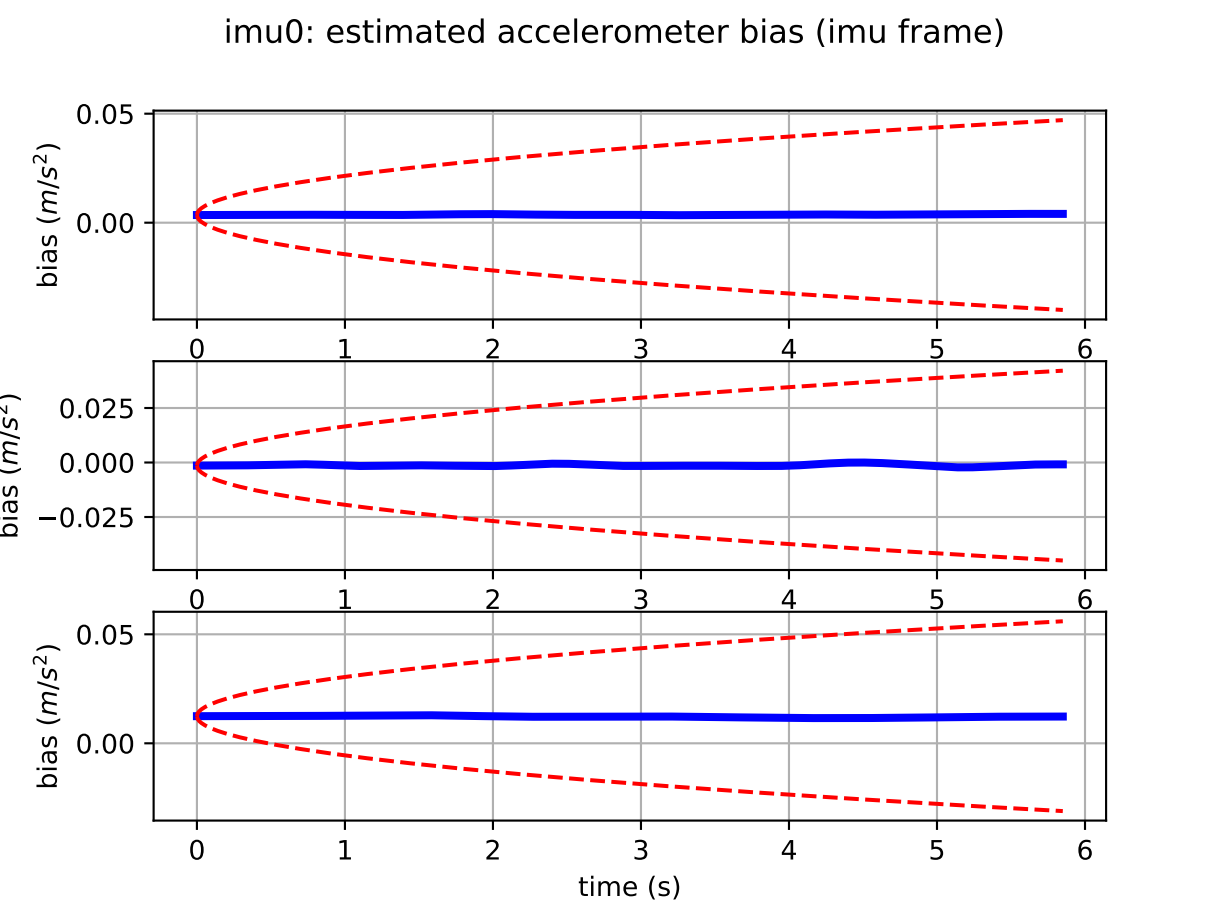
IMU configuration
==========

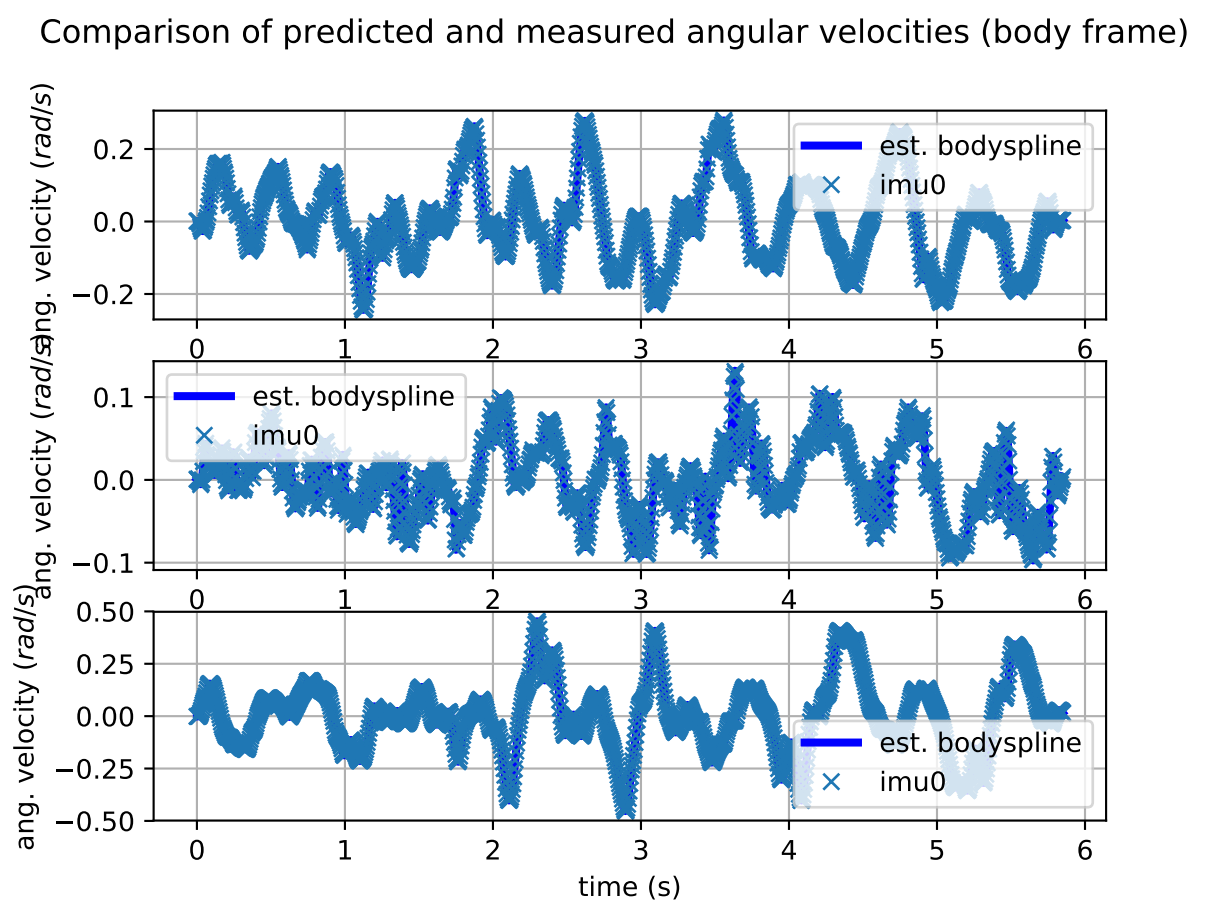
IMU0:

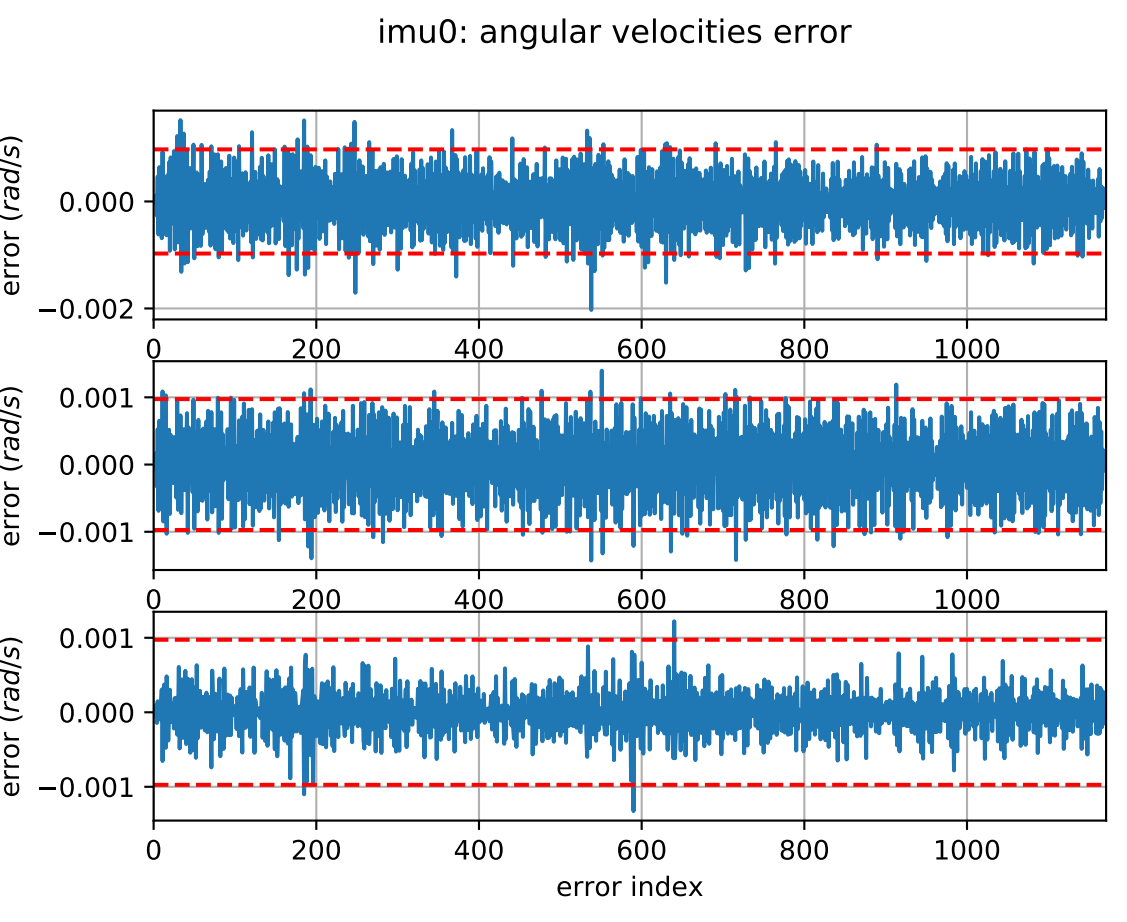
  Model: calibrated
  Update rate: 70.0
  Accelerometer:
    Noise density: 0.004
    Noise density (discrete): 0.0334664010614
    Random walk: 0.006
  Gyroscope:
    Noise density: 3.8785e-05
    Noise density (discrete): 0.000324498591291
    Random walk: 0.0003394
  T_i_b
    [[1. 0. 0. 0.]
     [0. 1. 0. 0.]
     [0. 0. 1. 0.]
     [0. 0. 0. 1.]]
  time offset with respect to IMU0: 0.0 [s]

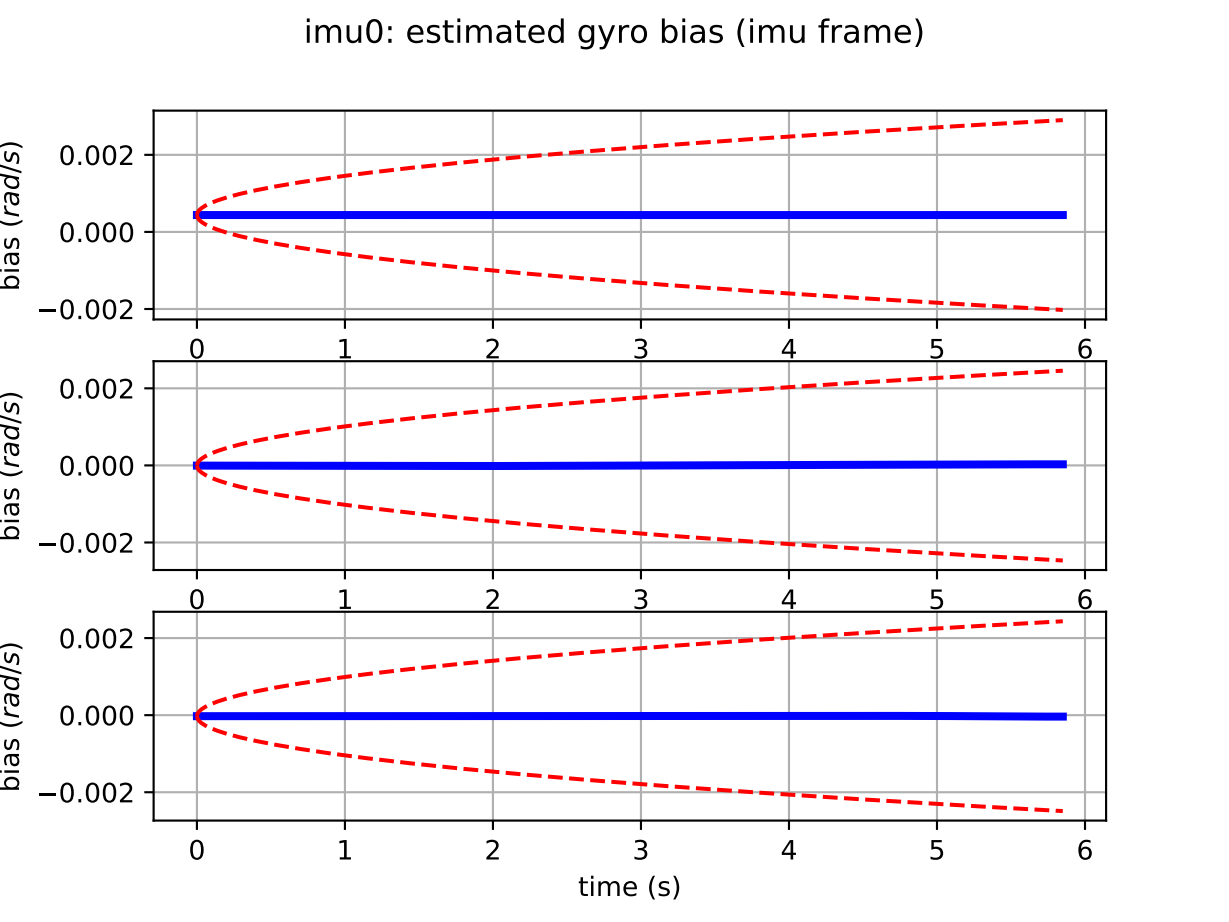

Comparison of predicted and measured specific force (imu0 frame)
specific force (m/s^2)
est. bodyspline
imu0
−7.5
−10.0
−12.5
0
1
2
3
4
5
6
specific force (m/s^2)
est. bodyspline
imu0
0
−2
specific force (m/s^2)
est. bodyspline
imu0
2
0
−2
time (s)

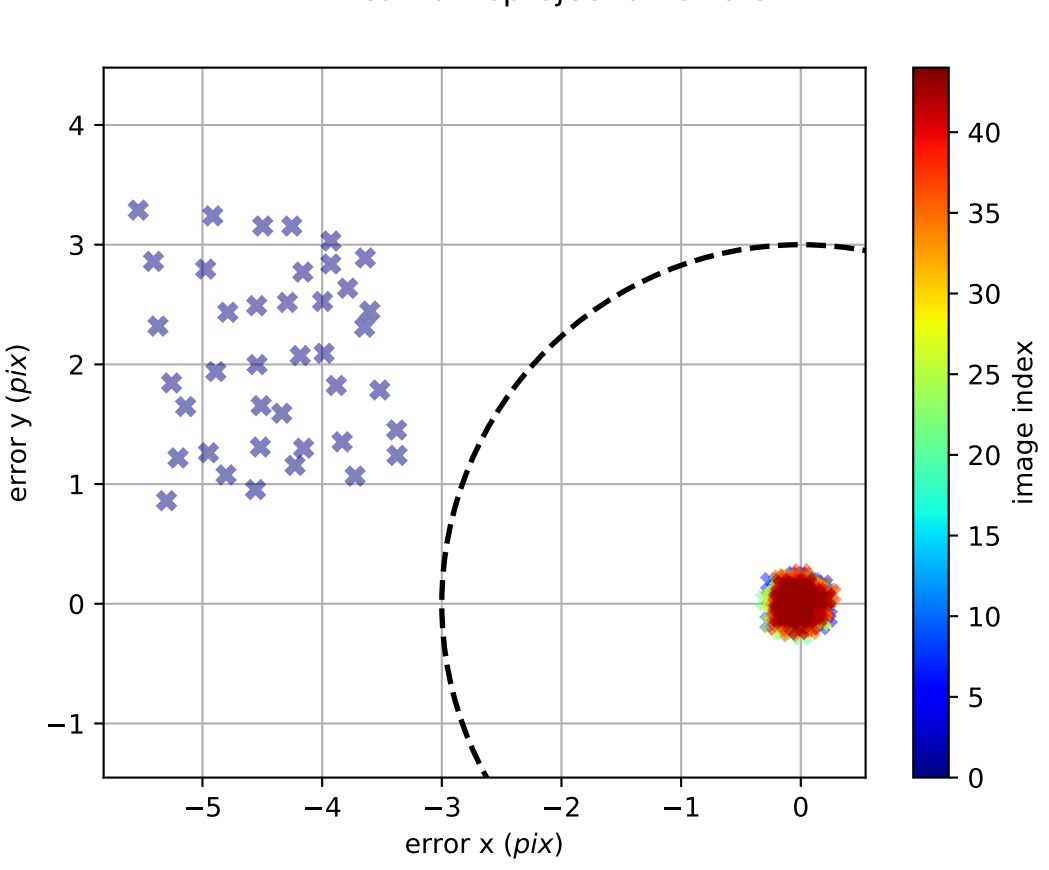

imu0: acceleration error
error (m/s^2)
1
0
−1
0
200
400
600
800
1000
error (m/s^2)
0.25
0.00
−0.25
0
200
400
600
800
1000
error (m/s^2)
0.25
0.00
−0.25
0
200
400
600
800
1000
error index


imu0: estimated accelerometer bias (imu frame)
bias (m/s^2)
0.05
0.00
0
1
2
3
4
5
6
bias (m/s^2)
0.025
0.000
−0.025
0
1
2
3
4
5
6
bias (m/s^2)
0.05
0.00
0
1
2
3
4
5
6
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
0.2
0.0
−0.2
0.1
0.0
−0.1
0.50
0.25
0.00
−0.25
−0.50
0
1
2
3
4
5
6
time (s)


imu0: angular velocities error
error (rad/s)
0.000
−0.002
0
200
400
600
800
1000
error (rad/s)
0.001
0.000
−0.001
0
200
400
600
800
1000
error (rad/s)
0.001
0.000
−0.001
0
200
400
600
800
1000
error index


imu0: estimated gyro bias (imu frame)
bias (rad/s)
0.002
0.000
−0.002
0
1
2
3
4
5
6
bias (rad/s)
0.002
0.000
−0.002
0
1
2
3
4
5
6
bias (rad/s)
0.002
0.000
−0.002
0
1
2
3
4
5
6
time (s)


cam0: reprojection errors
error x (pix)
error y (pix)
image index
4
3
2
1
0
−1
−5
−4
−3
−2
−1
0
40
35
30
25
20
15
10
5
0