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

Reprojection error (cam0): mean 0.0894984507821, median 0.0848270471476, std: 0.0463043960345
Gyroscope error (imu0): mean 2.68245798634, median 2.63555870705, std: 0.861692470206
Accelerometer error (imu0): mean 32.4535162774, median 32.4579466172, std: 1.71851433001

Residuals

Reprojection error (cam0) [px]: mean 0.0894984507821, median 0.0848270471476, std: 0.0463043960345
Gyroscope error (imu0) [rad/s]: mean 0.000870453837766, median 0.000855235087702, std: 0.000279615
Accelerometer error (imu0) [m/s^2]: mean 1.08610239159, median 1.08625065912, std: 0.0575124897979

Transformation (cam0):

T_ci: (imu0 to cam0):
[[-0.00003732 -0.99999861 -0.00166833 0.05983568]
 [0.9999987 -0.00003463 -0.00161329 0.00022186]
 [0.00161323 -0.00166839 0.99999731 -0.10103605]
 [0.   0.   0.   1.   ]]

T_ic: (cam0 to imu0):
[[-0.00003732 0.9999987   0.00161323 -0.00005664]
 [-0.99999861 -0.00003463 -0.00166839 0.05966704]
 [-0.00166833 -0.00161329 0.99999731 0.10113596]
 [0.   0.   0.   1.   ]]

timeshift cam0 to imu0: [s] (t_imu = t_cam + shift)
0.003848550361855997

Gravity vector in target coords: [m/s^2]
[0.00201423 9.80654635 -0.00822031]

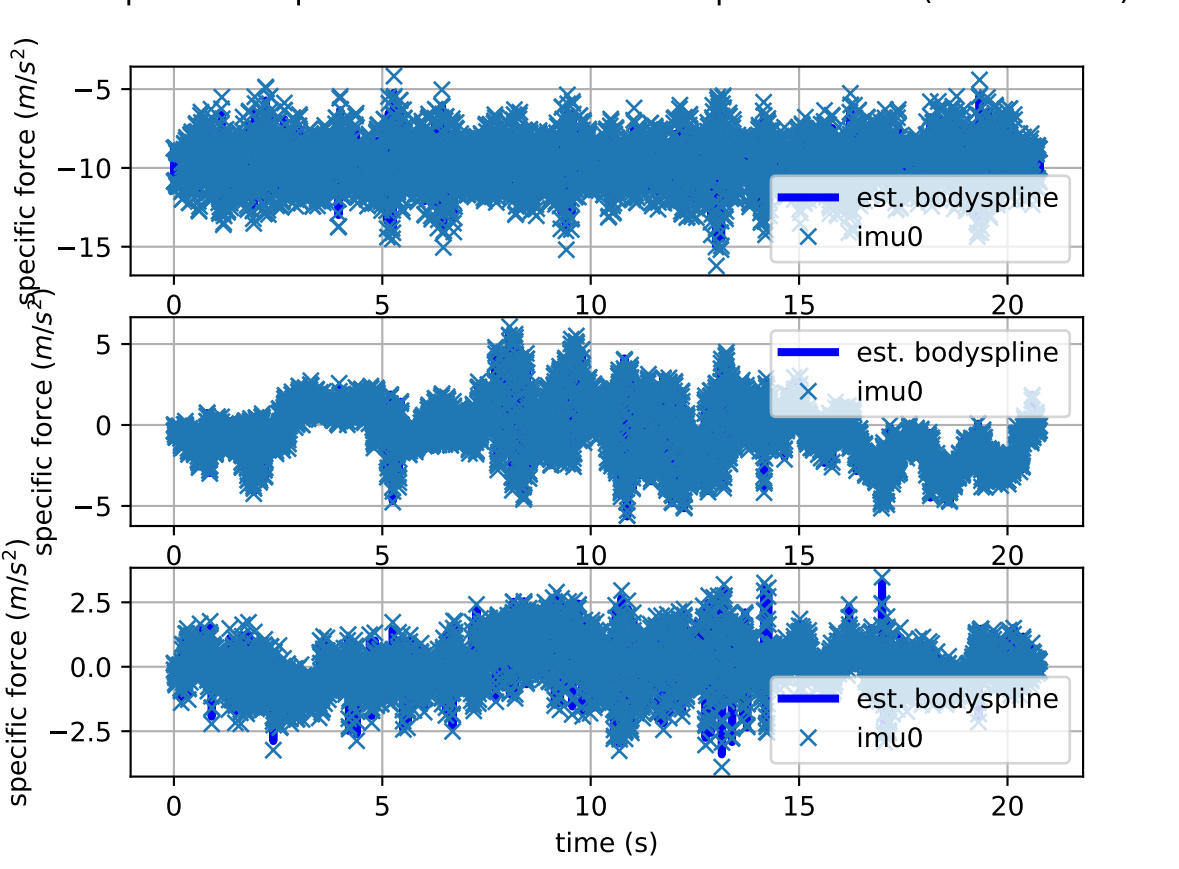
Calibration configuration

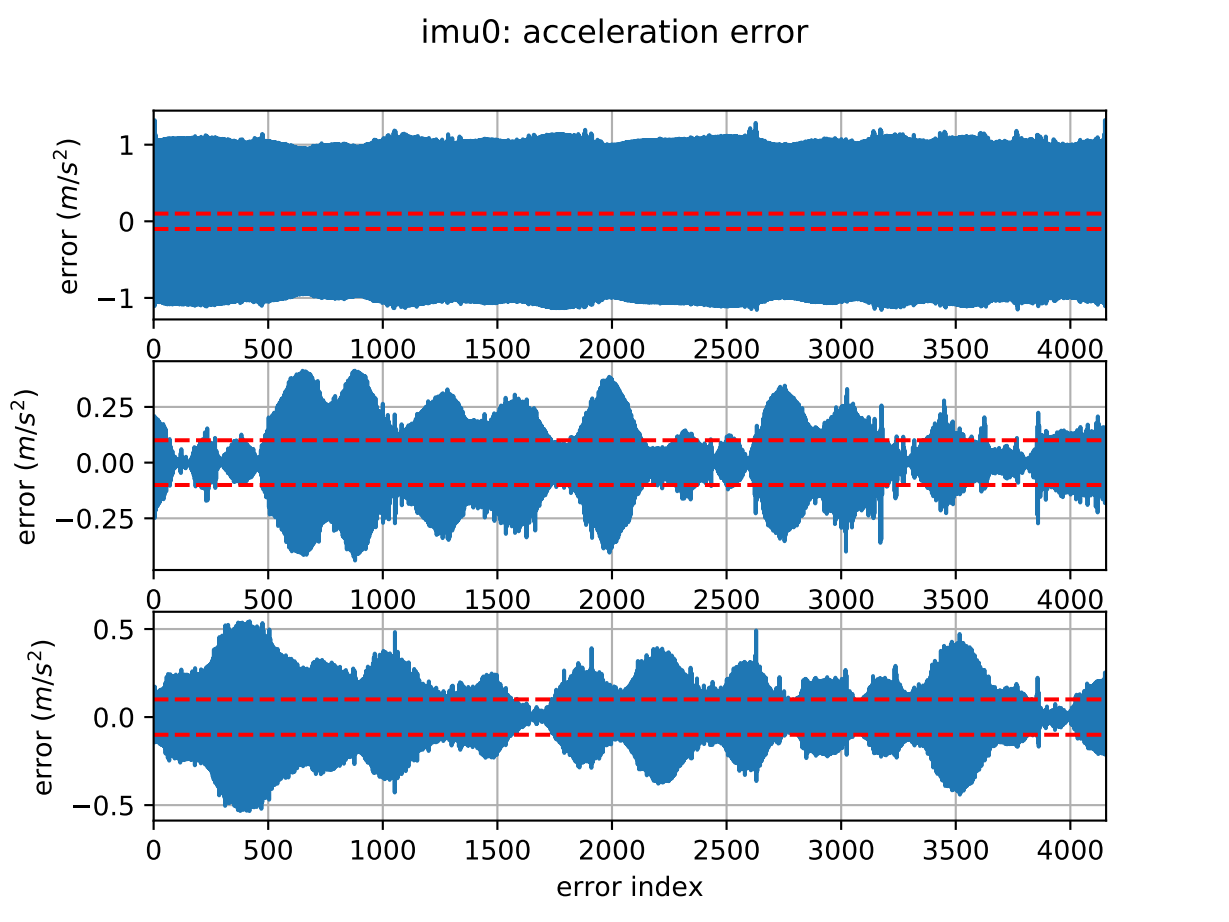
  Camera model: pinhole
  Focal length: [585.7561, 585.7561]
  Principal point: [320.5, 240.5]
  Distortion model: radtan
  Distortion coefficients: [0.0, 0.0, 0.0, 0.0]
  Type: checkerboard
  Rows
    Count: 6
    Distance: 0.01 [m]
  Cols
    Count: 7
    Distance: 0.01 [m]

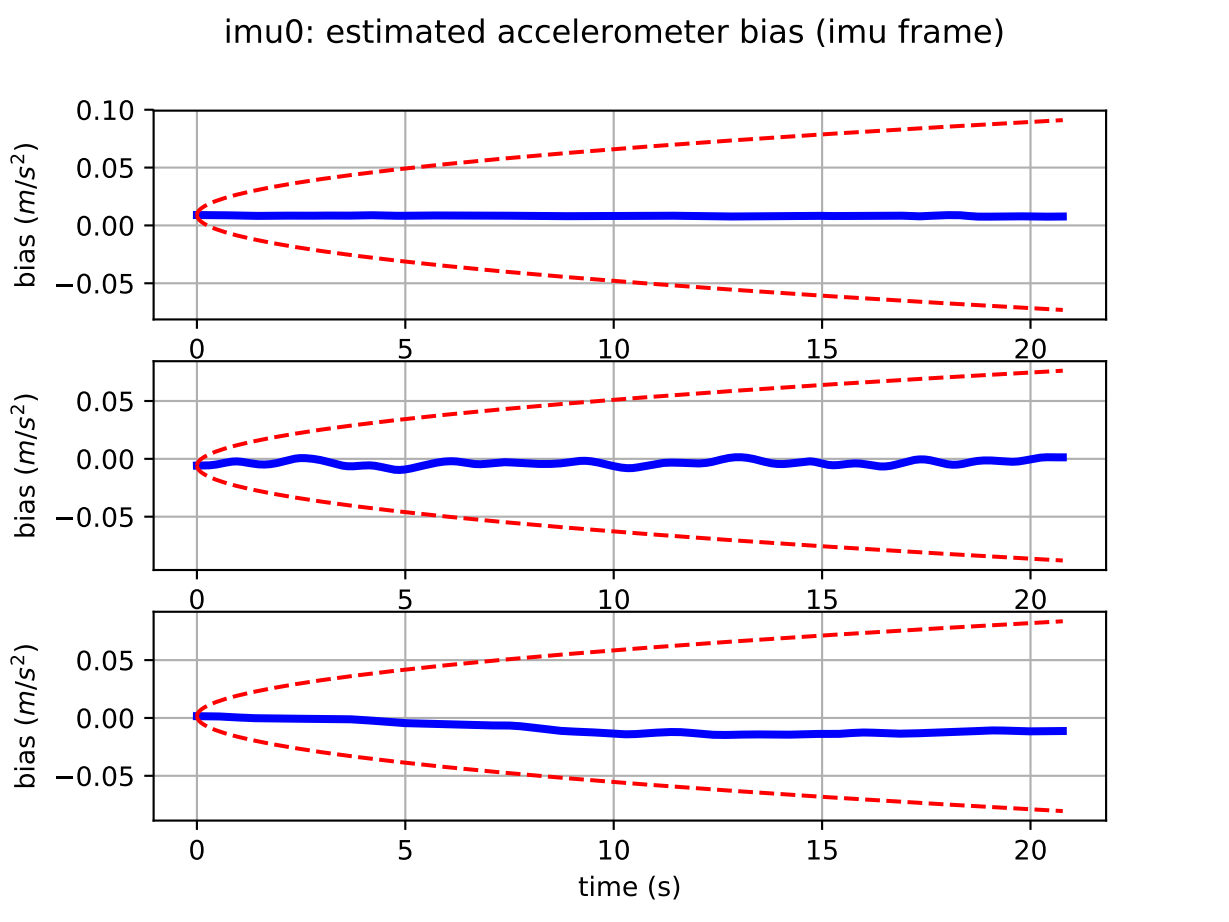
IMU configuration
==========

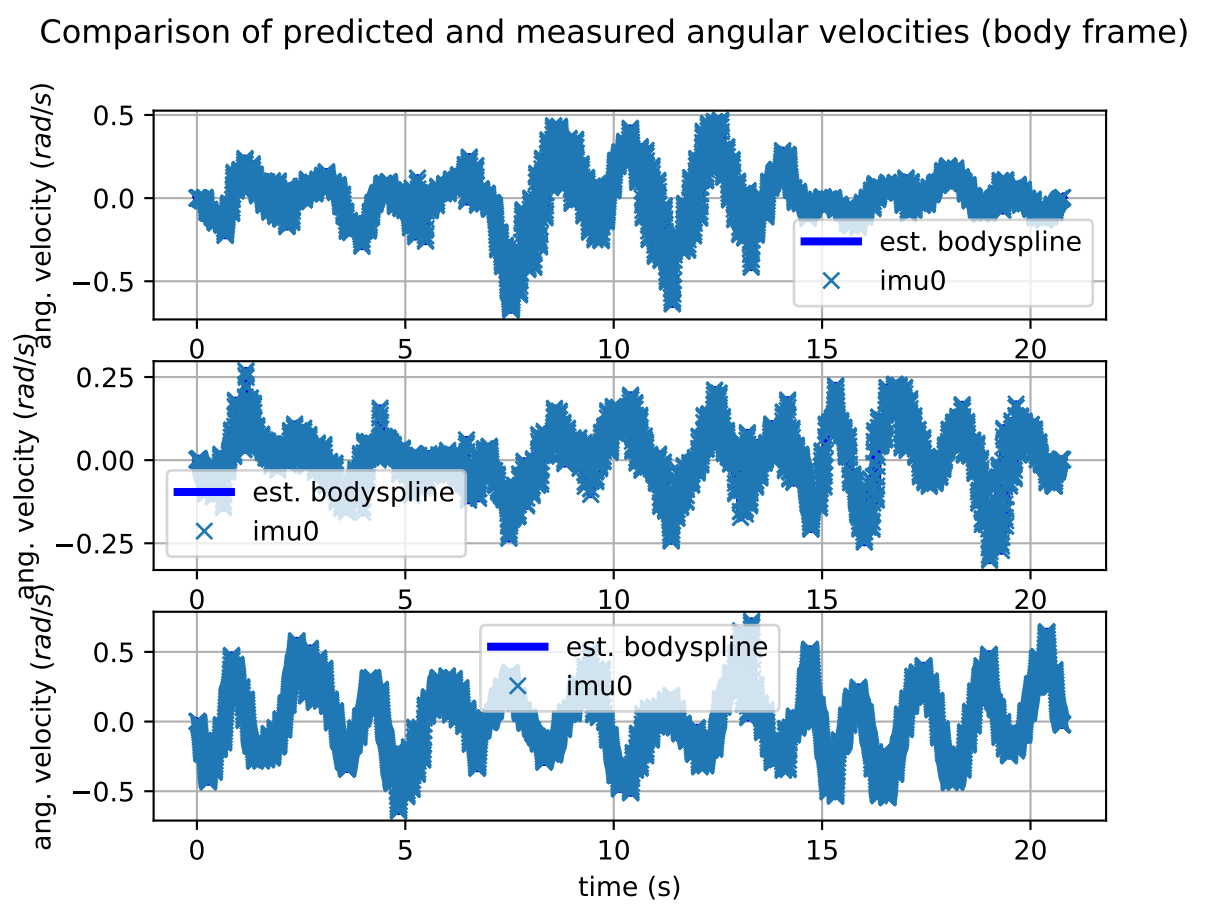
IMU0:

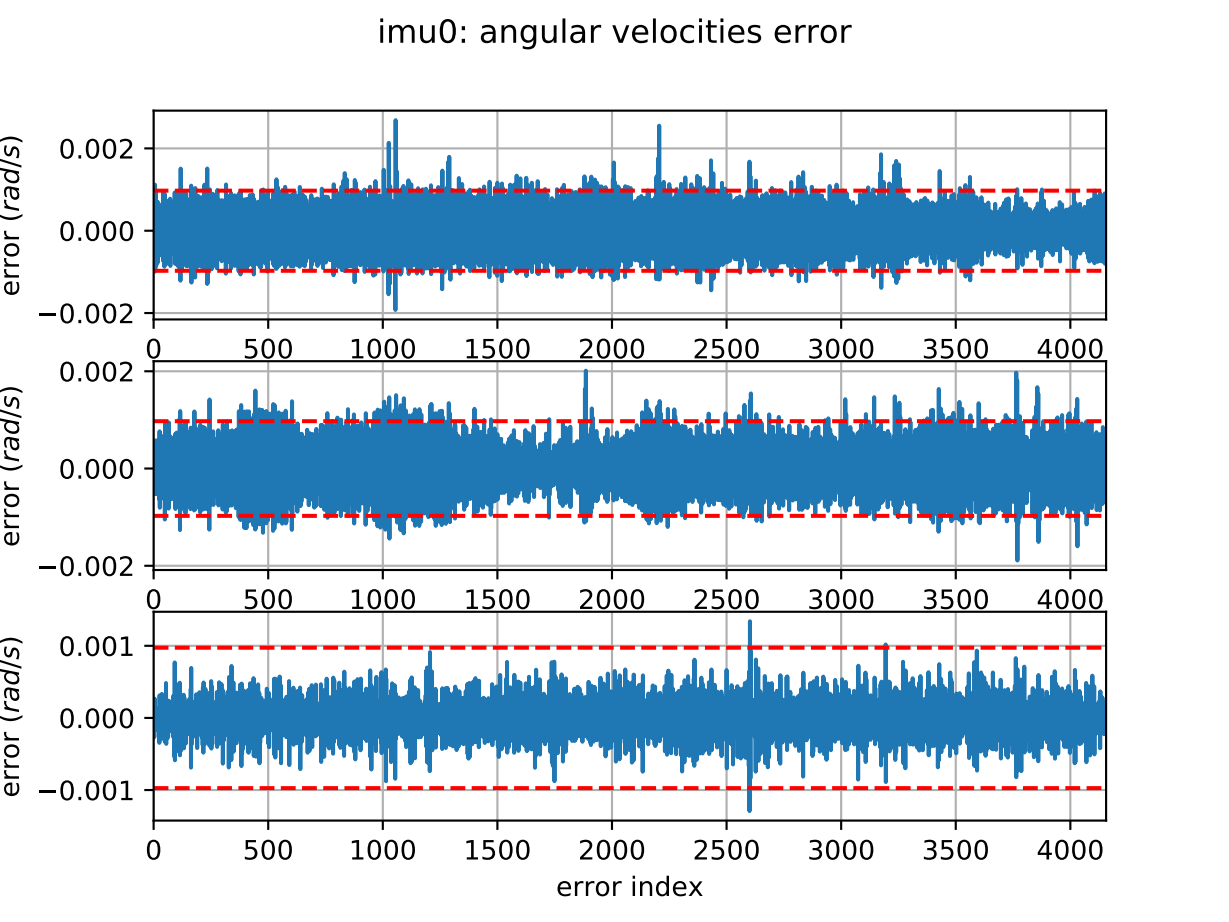
  Model: calibrated
  Update rate: 70.0
  Accelerometer:
    Noise density: 0.004
    Noise density (discrete): 0.0334664010614
    Random walk: 0.006
  Gyroscope:
    Noise density: 3.8785e-05
    Noise density (discrete): 0.000324498591291
    Random walk: 0.0003394
  T_i_b
    [[1. 0. 0. 0.]
     [0.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

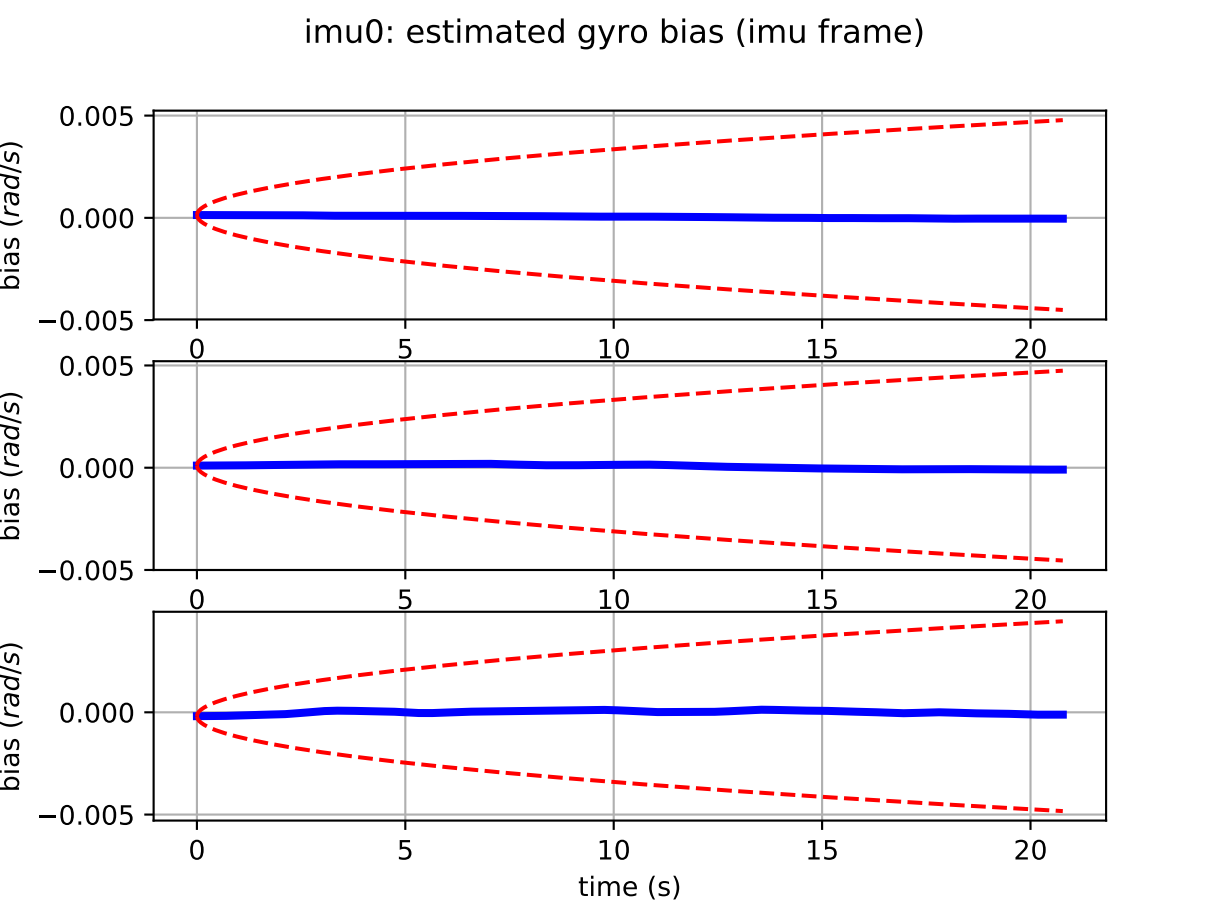

Comparison of predicted and measured specific force (imu0 frame)
specific force (m/s^2)
specific force (m/s^2)
specific force (m/s^2)
est. bodyspline
imu0
est. bodyspline
imu0
est. bodyspline
imu0
−5
−10
−15
5
0
−5
2.5
0.0
−2.5
0
5
10
15
20
time (s)

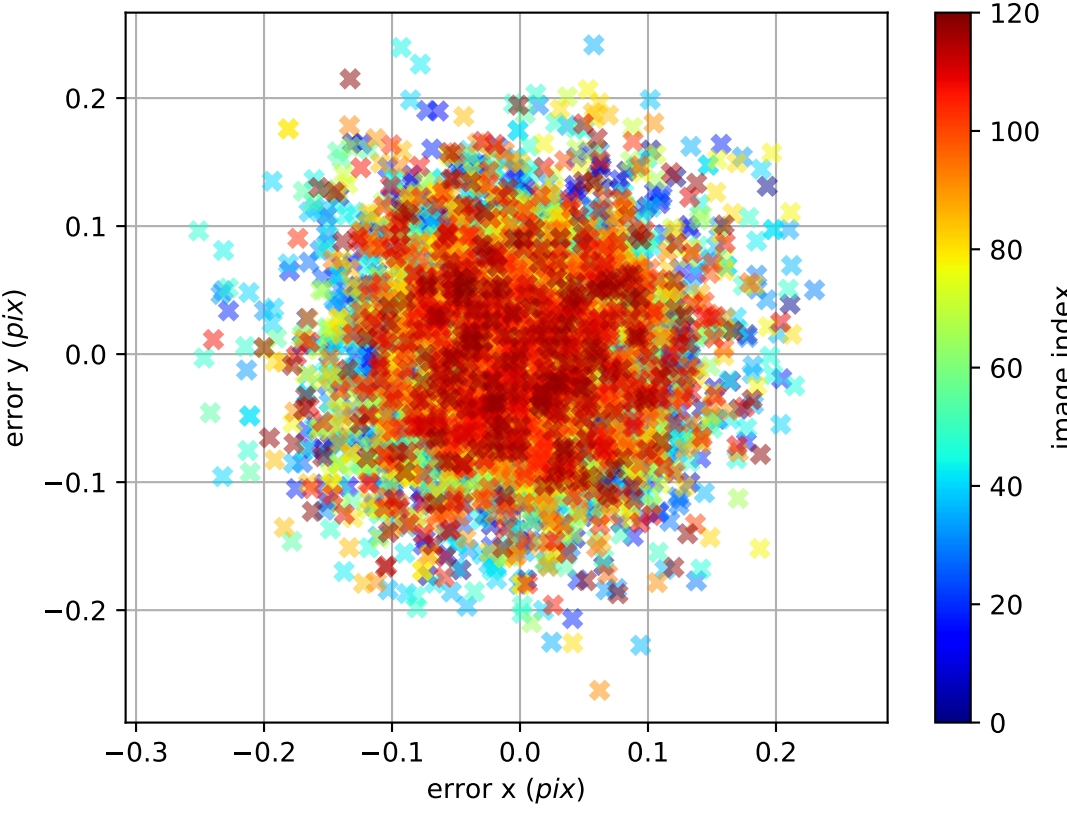

imu0: acceleration error
error (m/s^2)
1
0
−1
0
500
1000
1500
2000
2500
3000
3500
4000
error (m/s^2)
0.25
0.00
−0.25
0
500
1000
1500
2000
2500
3000
3500
4000
error (m/s^2)
0.5
0.0
−0.5
0
500
1000
1500
2000
2500
3000
3500
4000
error index


imu0: estimated accelerometer bias (imu frame)
bias (m/s^2)
0.10
0.05
0.00
−0.05
0
5
10
15
20
bias (m/s^2)
0.05
0.00
−0.05
0
5
10
15
20
bias (m/s^2)
0.05
0.00
−0.05
0
5
10
15
20
time (s)


Comparison of predicted and measured angular velocities (body frame)
ang. velocity (rad/s)
ang. velocity (rad/s)
ang. velocity (rad/s)
0.5
0.0
−0.5
0.25
0.00
−0.25
0
5
10
15
20
time (s)
est. bodyspline
imu0


imu0: angular velocities error
error (rad/s)
0.002
0.000
−0.002
0
500
1000
1500
2000
2500
3000
3500
4000
error (rad/s)
0.002
0.000
−0.002
0
500
1000
1500
2000
2500
3000
3500
4000
error (rad/s)
0.001
0.000
−0.001
0
500
1000
1500
2000
2500
3000
3500
4000
error index


imu0: estimated gyro bias (imu frame)
bias (rad/s)
0.005
0.000
−0.005
0
5
10
15
20
time (s)


cam0: reprojection errors
error x (pix)
error y (pix)
image index
−0.3
−0.2
−0.1
0.0
0.1
0.2
0
20
40
60
80
100
120