

## Calibration results

=====

### Normalized Residuals

-----

Reprojection error (cam0): mean 0.045572406739, median 0.0419697162195, std: 0.0255776449664  
Gyroscope error (imu0): mean 0.0689976620843, median 0.0487547471446, std: 0.0605975130779  
Accelerometer error (imu0): mean 0.968547774275, median 0.2309237286, std: 1.56042965344

### Residuals

-----

Reprojection error (cam0) [px]: mean 0.045572406739, median 0.0419697162195, std: 0.0255776449664  
Gyroscope error (imu0) [rad/s]: mean 0.00487887147458, median 0.0034474812321, std: 0.00428489124  
Accelerometer error (imu0) [m/s<sup>2</sup>]: mean 0.136973339819, median 0.0326575468859, std: 0.2206780779

### Transformation (cam0):

-----

T\_ci: (imu0 to cam0):

```
[[ 0.99997223  0.00203342  0.00717013 -0.04071191]
 [-0.00197117  0.9999604  -0.00867817 -0.00522268]
 [-0.00718749  0.00866379  0.99993664 -0.0028997 ]
 [ 0.          0.          0.          1.          ]]
```

T\_ic: (cam0 to imu0):

```
[[ 0.99997223 -0.00197117 -0.00718749  0.04067965]
 [ 0.00203342  0.9999604   0.00866379  0.00533038]
 [ 0.00717013 -0.00867817  0.99993664  0.0031461 ]
 [ 0.          0.          0.          1.          ]]
```

timeshift cam0 to imu0: [s] (t\_imu = t\_cam + shift)  
0.0014042984999845167

Gravity vector in target coords: [m/s<sup>2</sup>]  
[ 9.80430982 -0.20369297 0.0494059 ]

Calibration configuration

-----  
Camera model: pinhole  
Focal length: [468.2527687453535, 468.3265694180005]  
Principal point: [364.91196913276707, 215.81303741968622]  
Distortion model: equidistant  
Distortion coefficients: [0.011135829319036753, -0.05338166866546771, 0.15329931633590166, -0.1346  
Type: checkerboard  
Rows  
  Count: 7  
  Distance: 0.07 [m]  
Cols  
  Count: 6  
  Distance: 0.07 [m]

#### IMU configuration

##### =====

##### IMU0:

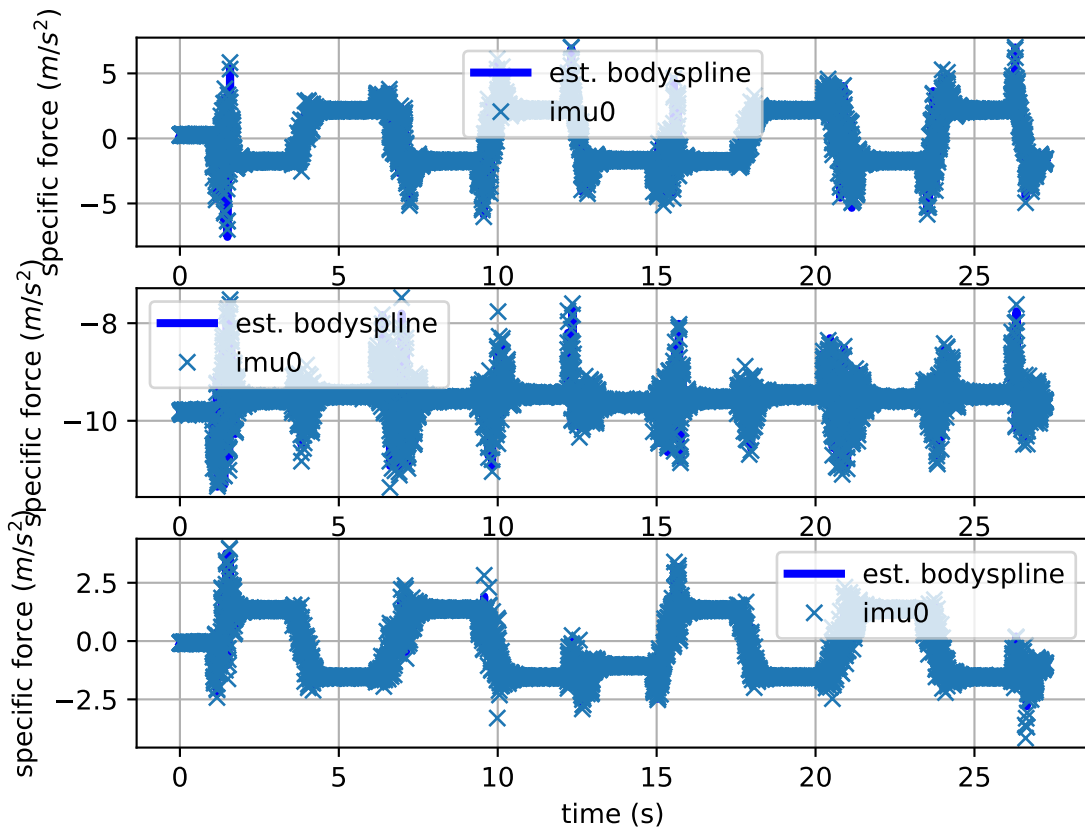
-----  
Model: calibrated  
Update rate: 200.0  
Accelerometer:  
  Noise density: 0.01  
  Noise density (discrete): 0.141421356237  
  Random walk: 0.0002  
Gyroscope:  
  Noise density: 0.005  
  Noise density (discrete): 0.0707106781187  
  Random walk: 4e-06

##### T\_i\_b

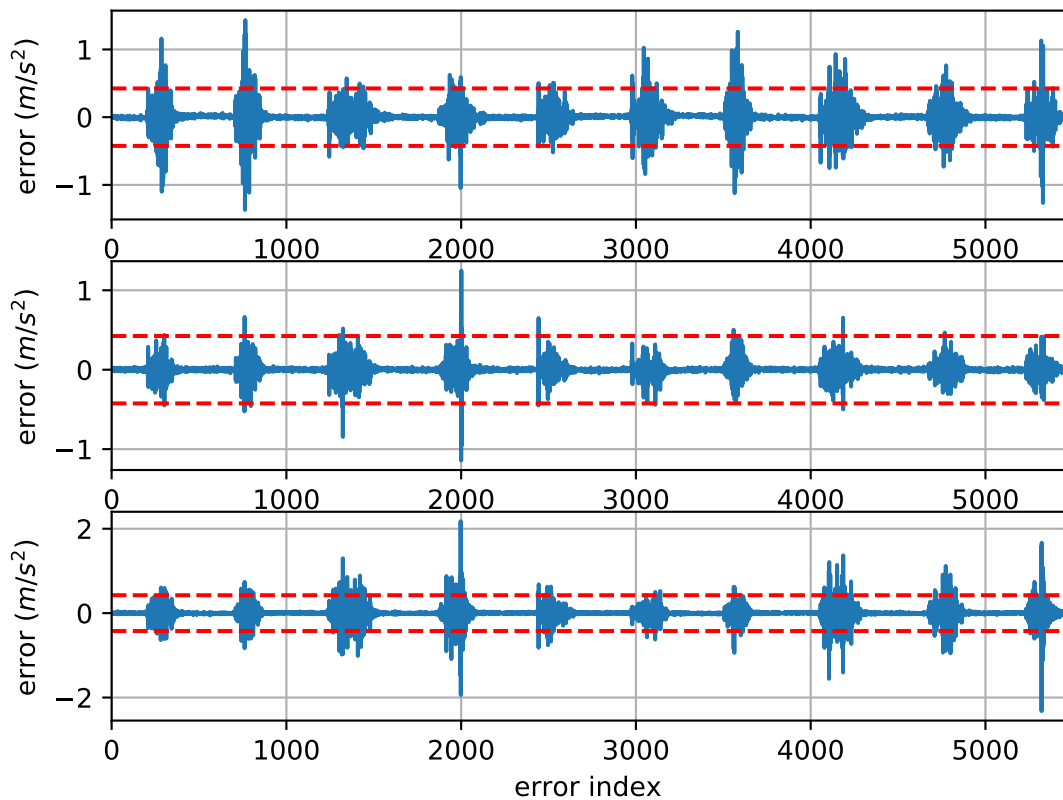
[[1. 0. 0. 0.]  
[0. 1. 0. 0.]  
[0. 0. 1. 0.]  
[0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

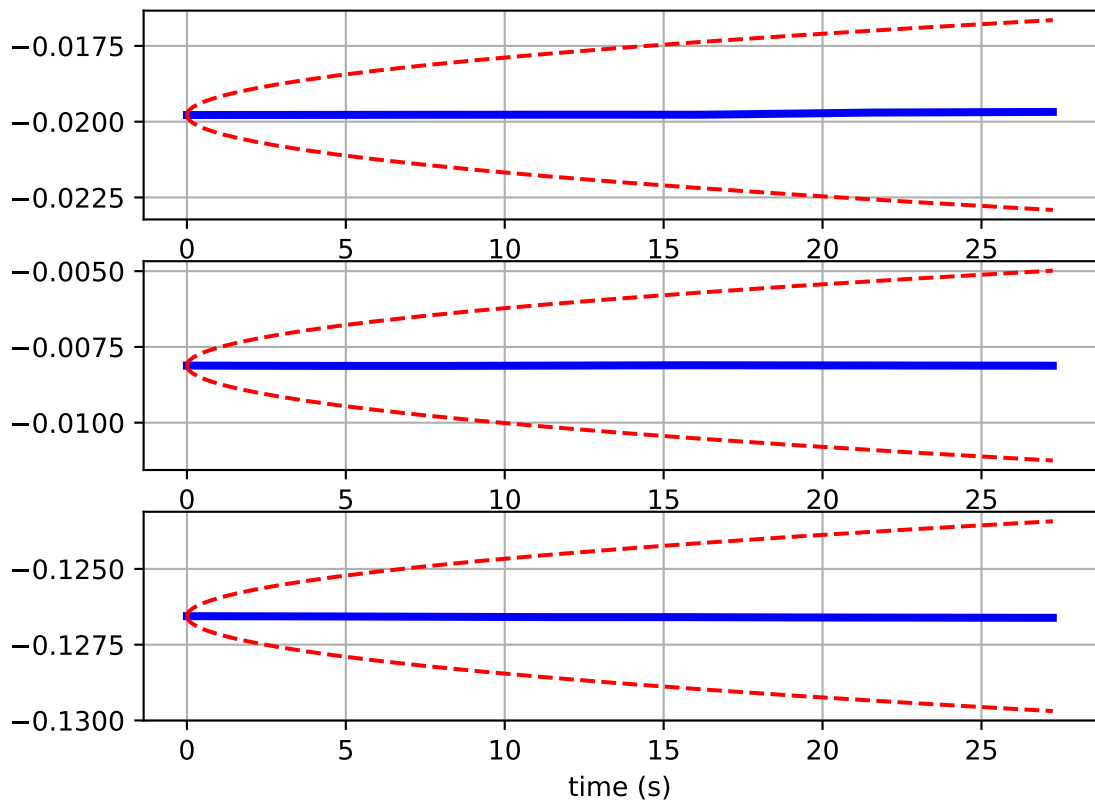
Comparison of predicted and measured specific force (imu0 frame)



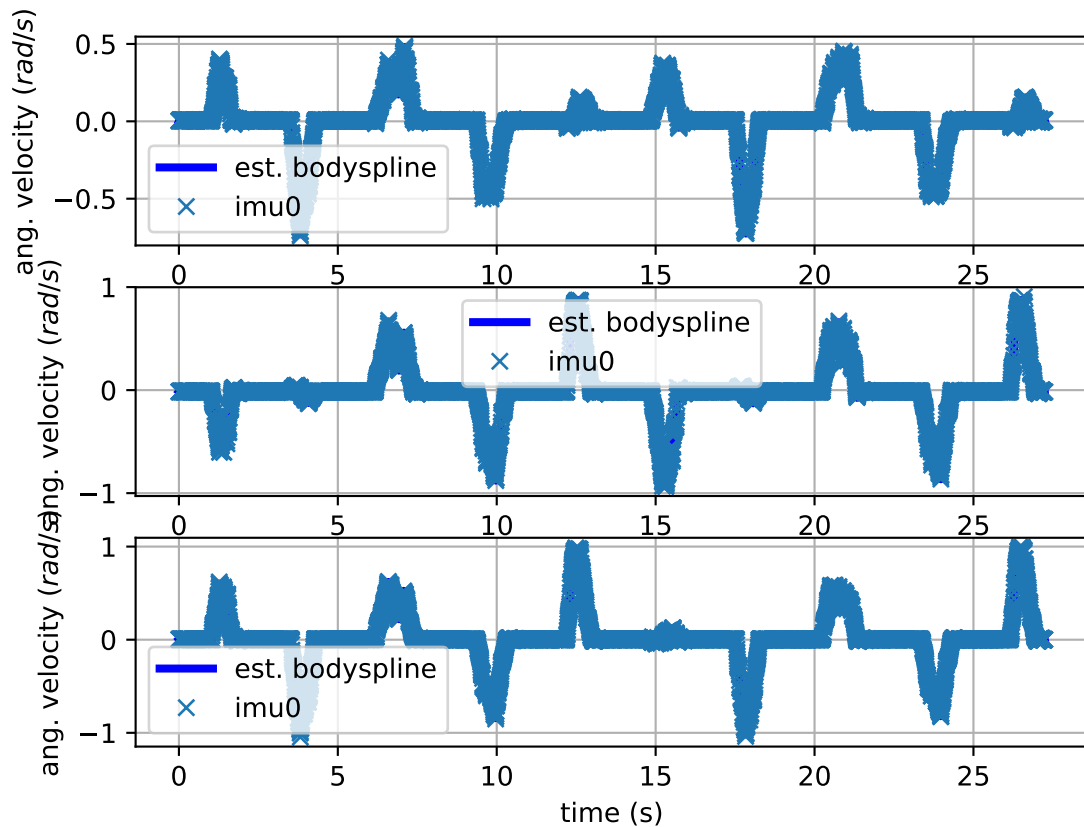
imu0: acceleration error



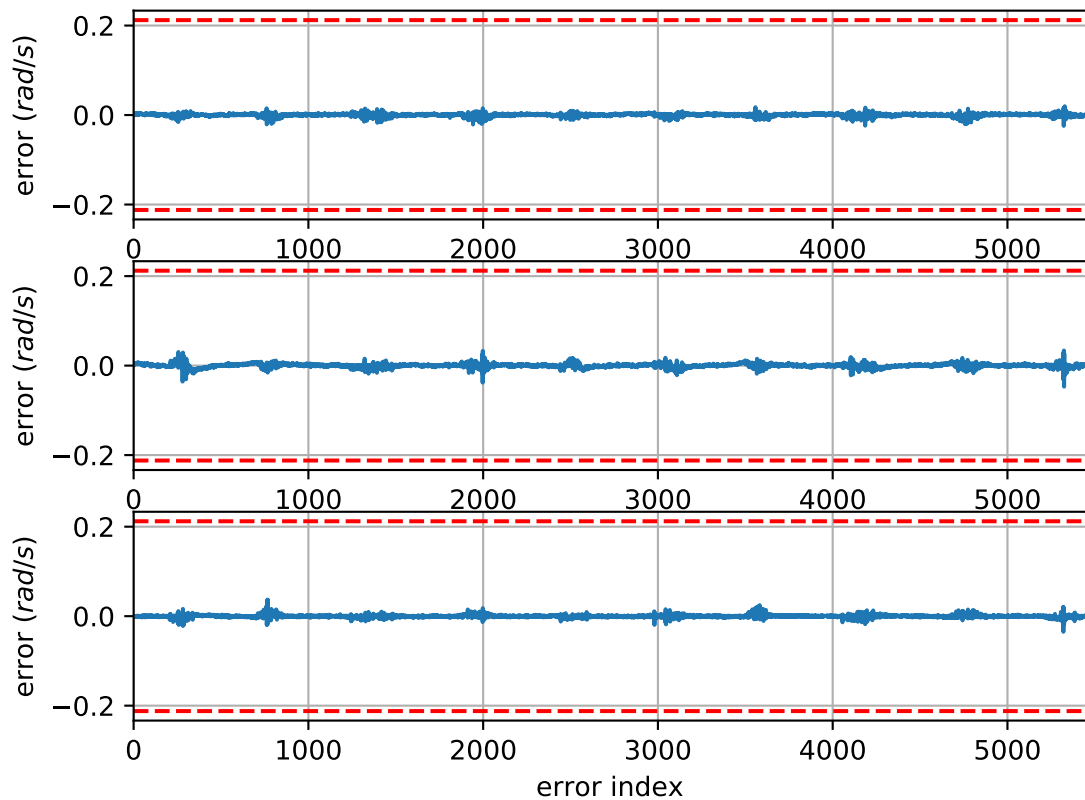
imu0: estimated accelerometer bias (imu frame)



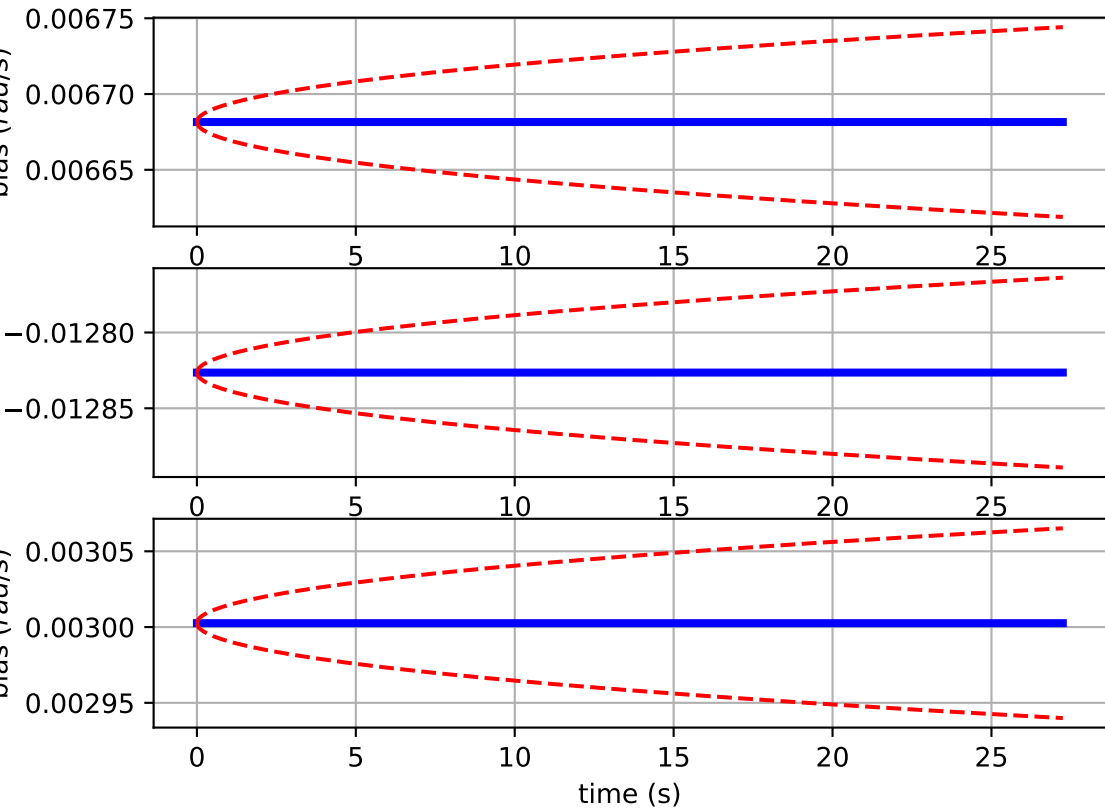
Comparison of predicted and measured angular velocities (body frame)



imu0: angular velocities error



imu0: estimated gyro bias (imu frame)





cam0: reprojection errors

