

## Calibration results

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### Normalized Residuals

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Reprojection error (cam0): mean 0.4070602483394918, median 0.3568653719876452, std: 0.2560966278

Gyroscope error (imu0): mean 0.4676633002336401, median 0.26430052910823626, std: 0.633907774

Accelerometer error (imu0): mean 1.2809387046132374, median 0.9582905928431044, std: 1.070863589

### Residuals

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Reprojection error (cam0) [px]: mean 0.4070602483394918, median 0.3568653719876452, std: 0.2560966278

Gyroscope error (imu0) [rad/s]: mean 0.07235451053051443, median 0.040891246773113454, std: 0.098

Accelerometer error (imu0) [m/s<sup>2</sup>]: mean 0.03351313643970429, median 0.02507170973222553, std: 0.0

### Transformation (cam0):

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T\_ci: (imu0 to cam0):

```
[[-0.99997308  0.00598725 -0.00424105  0.00141066]
 [-0.00622422 -0.99828201  0.05826043  0.05686917]
 [-0.00388495  0.05828526  0.99829241  0.02040469]
 [ 0.          0.          0.          1.          ]]
```

T\_ic: (cam0 to imu0):

```
[[-0.99997308 -0.00622422 -0.00388495  0.00184385]
 [ 0.00598725 -0.99828201  0.05828526  0.05557373]
 [-0.00424105  0.05826043  0.99829241 -0.02367709]
 [ 0.          0.          0.          1.          ]]
```

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

-0.007930718604559243

Gravity vector in target coords: [m/s<sup>2</sup>]

```
[ 0.10174661 -9.8039627 -0.20096227]
```

## Calibration configuration

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Camera model: pinhole  
Focal length: [381.50091715225676, 380.6841806683357]  
Principal point: [321.71880735049814, 239.39601119612195]  
Distortion model: radtan  
Distortion coefficients: [-0.002546507979782821, -0.0019901595883390177, 0.0013933664140284017, -0.00019901595883390177, 0.00013933664140284017]  
Type: aprilgrid  
Tags:  
Rows: 6  
Cols: 6  
Size: 0.021 [m]  
Spacing 0.005999994000000001 [m]

## IMU configuration

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### IMU0:

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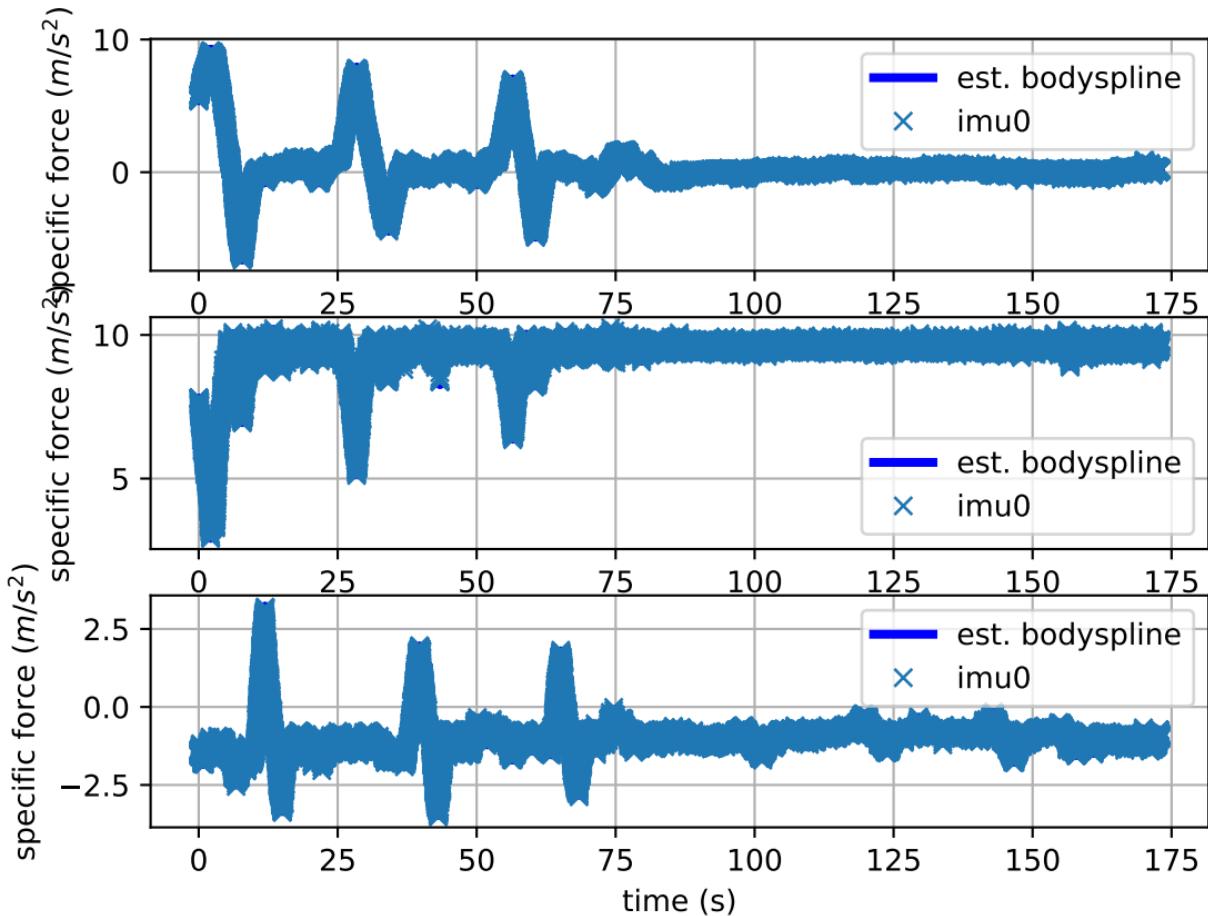
Model: calibrated  
Update rate: 200.0  
Accelerometer:  
Noise density: 0.00185  
Noise density (discrete): 0.02616295090390226  
Random walk: 2.548e-05

Gyroscope:  
Noise density: 0.01094  
Noise density (discrete): 0.1547149637236166  
Random walk: 0.0005897

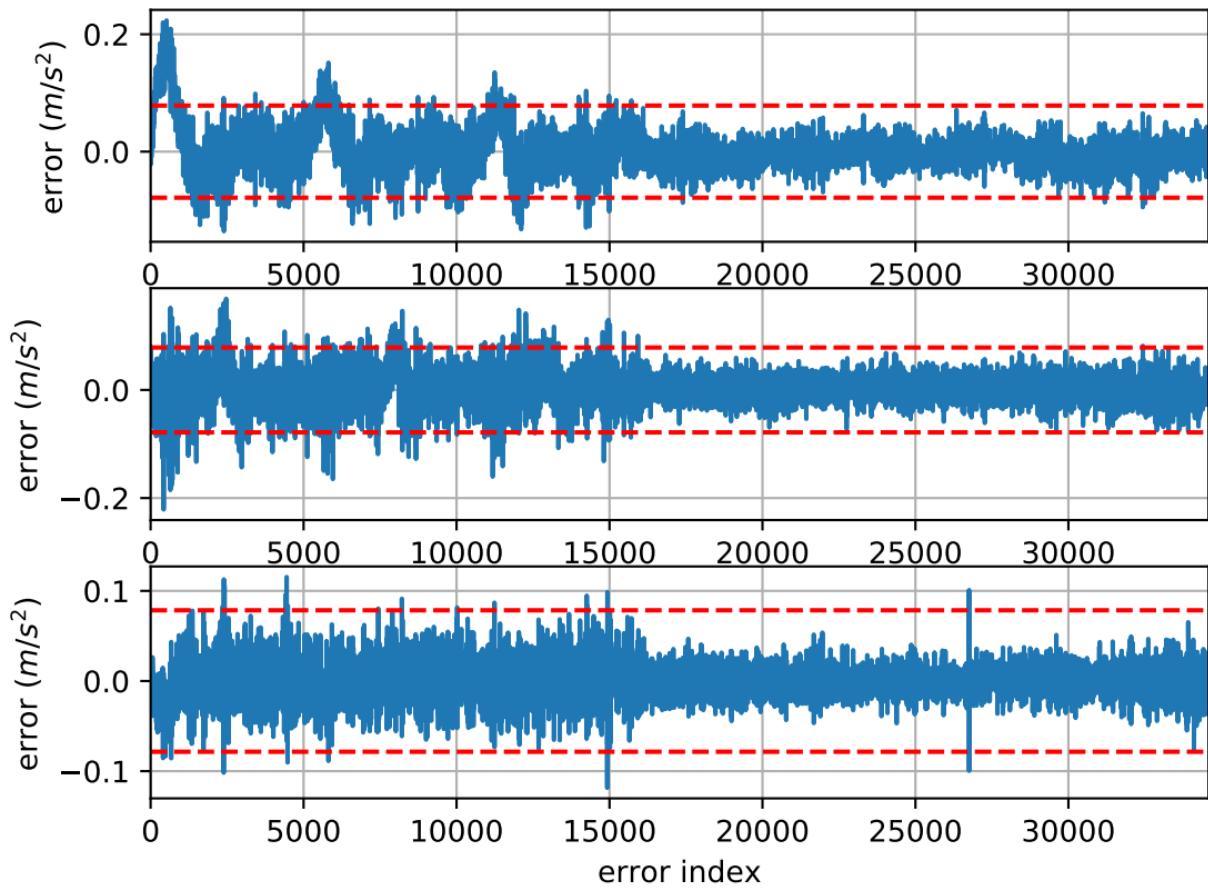
T\_i\_b  
[[1. 0. 0.  
[0. 1. 0.  
[0. 0. 1.  
[0. 0. 0. 1.]

time offset with respect to IMU0: 0.0 [s]

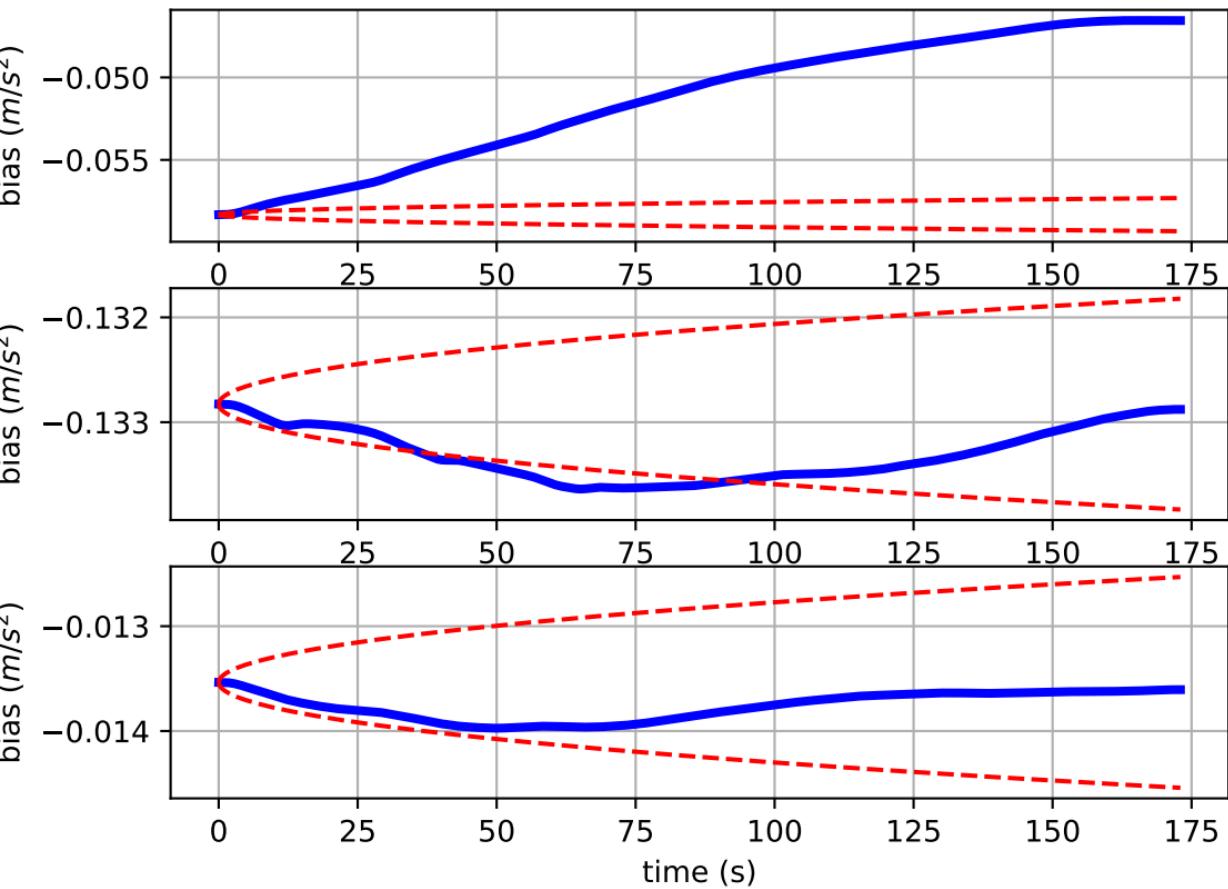
# Comparison of predicted and measured specific force (imu0 frame)



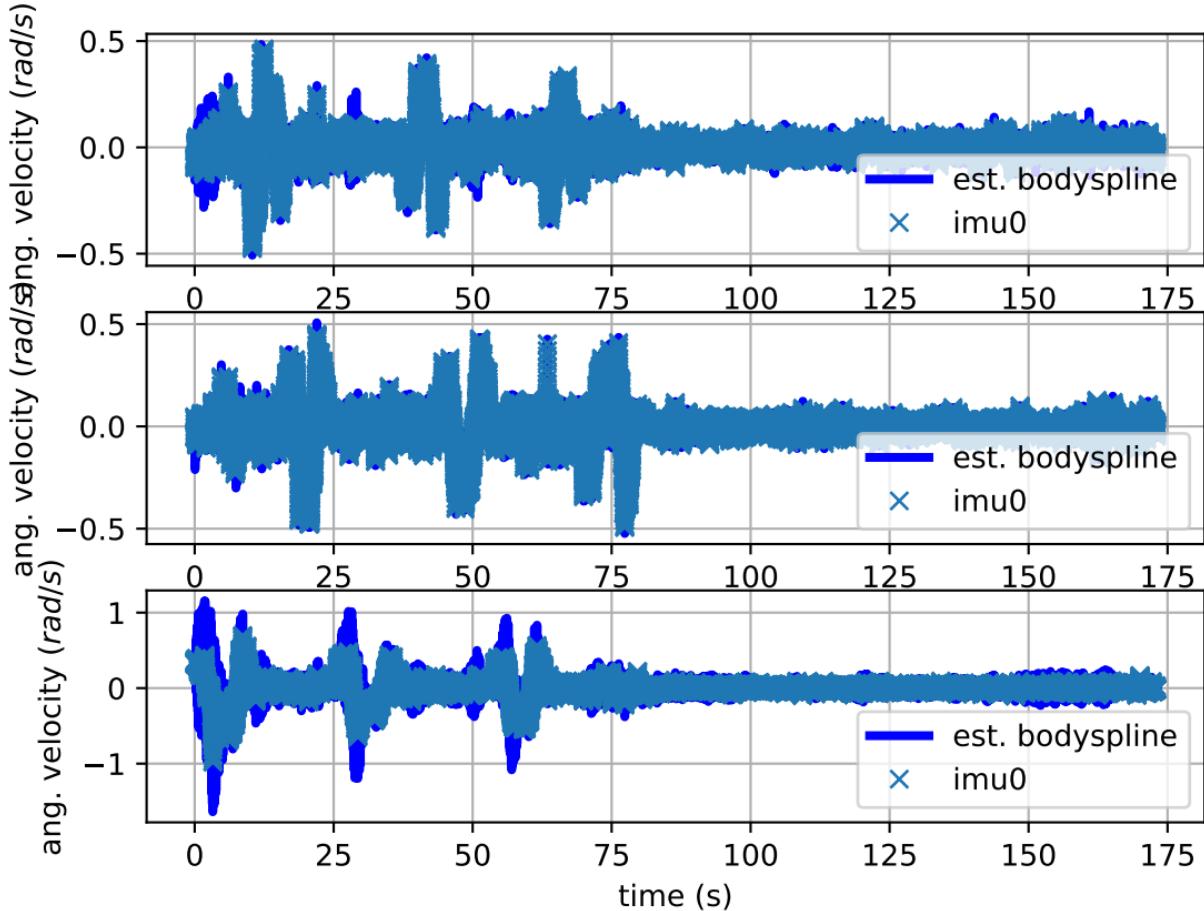
# imu0: acceleration error



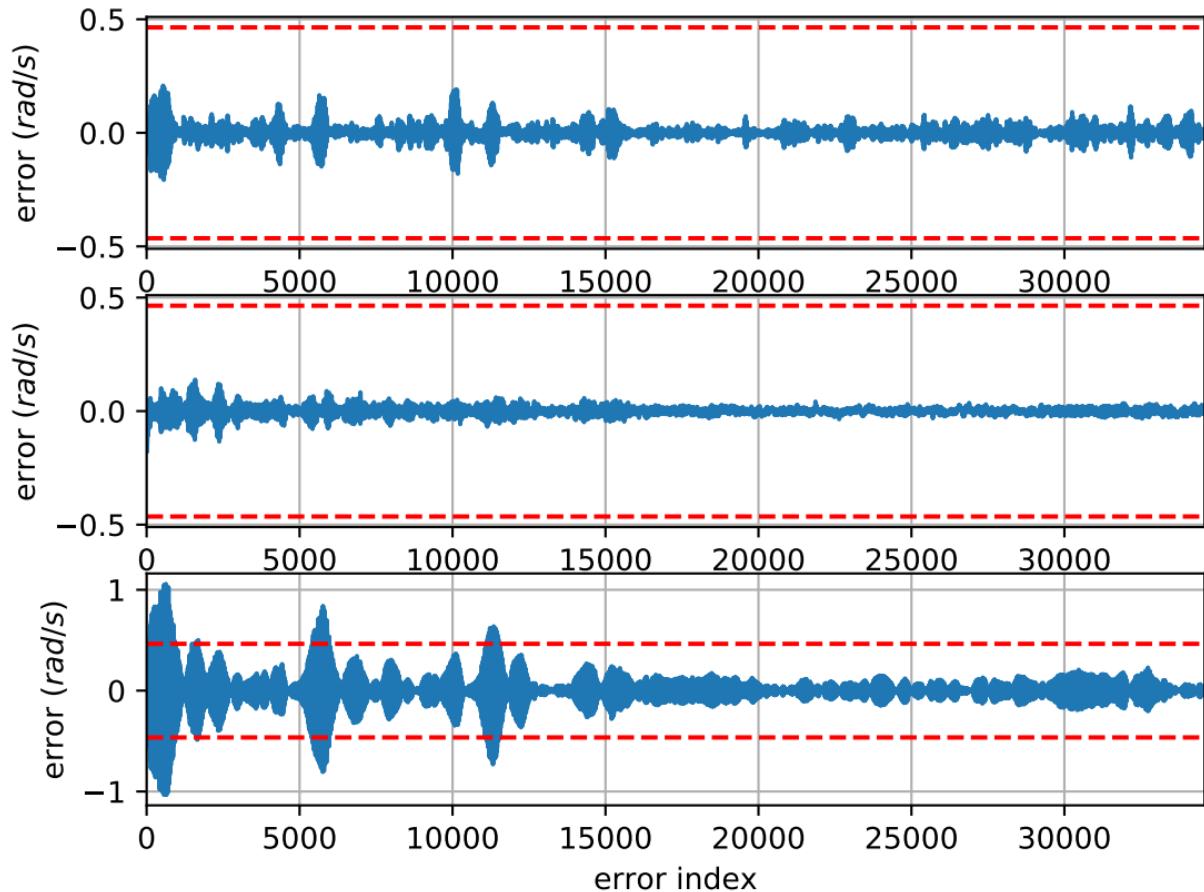
# imu0: estimated accelerometer bias (imu frame)



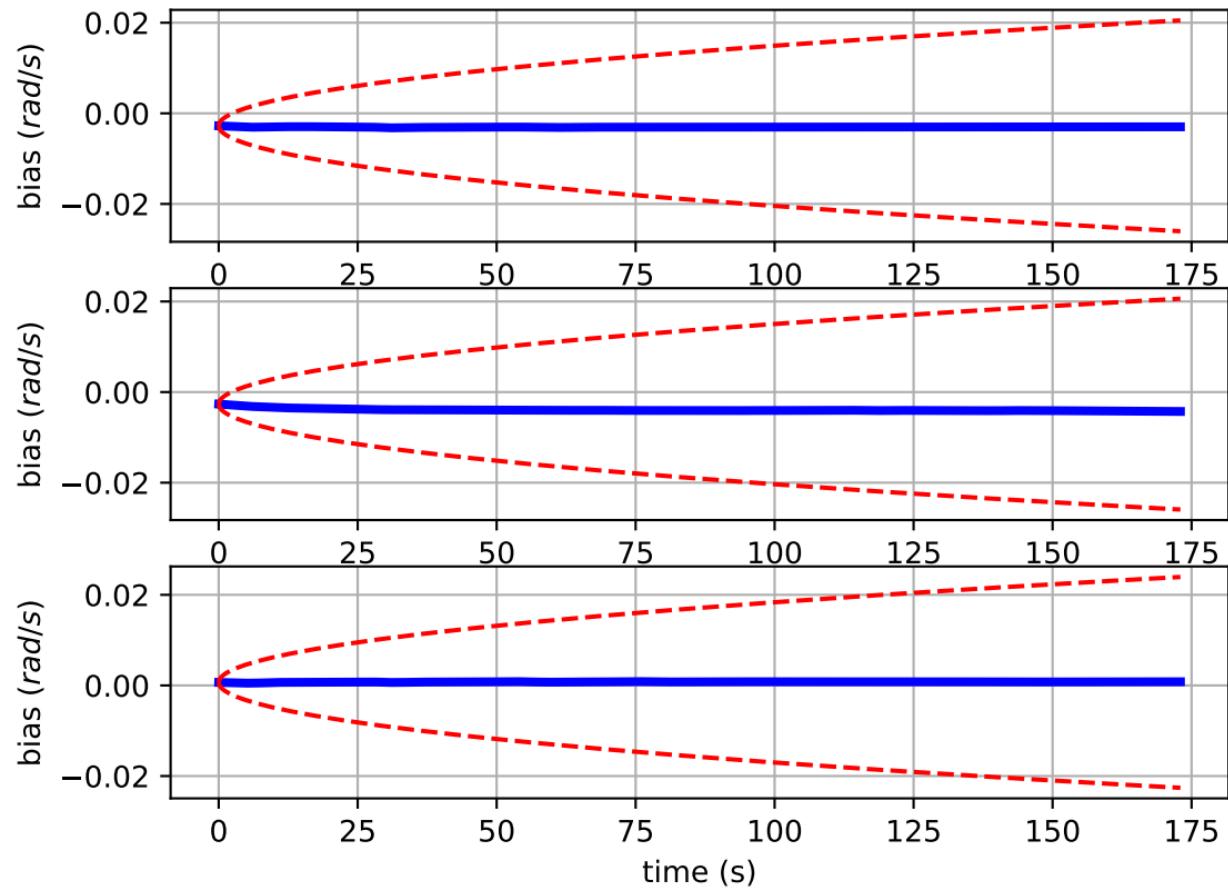
# Comparison of predicted and measured angular velocities (body frame)



# imu0: angular velocities error



# imu0: estimated gyro bias (imu frame)



cam0: reprojection errors

