

## Calibration results

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### Normalized Residuals

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Reprojection error (cam0): mean 8.20838323502, median 8.38666209026, std: 2.26551852028

Gyroscope error (imu0): mean 1.0940290874, median 0.897722483792, std: 0.845723304155

Accelerometer error (imu0): mean 1.42869126768, median 1.23113661321, std: 0.920731272424

### Residuals

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Reprojection error (cam0) [px]: mean 8.20838323502, median 8.38666209026, std: 2.26551852028

Gyroscope error (imu0) [rad/s]: mean 0.0847431287157, median 0.0695372845849, std: 0.065509445449

Accelerometer error (imu0) [m/s<sup>2</sup>]: mean 0.221331899464, median 0.190726863995, std: 0.14263907537

### Transformation (cam0):

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T\_ci: (imu0 to cam0):

```
[[ 0.09931723 -0.98456414 -0.14411645  0.15809872]
 [-0.99469552 -0.09433727 -0.04100369  0.04017864]
 [ 0.02677521  0.14742436 -0.98871085 -0.23257837]
 [ 0.          0.          0.          1.        ]]
```

T\_ic: (cam0 to imu0):

```
[[ 0.09931723 -0.99469552  0.02677521  0.03049092]
 [-0.98456414 -0.09433727  0.14742436  0.19373639]
 [-0.14411645 -0.04100369 -0.98871085 -0.20552066]
 [ 0.          0.          0.          1.        ]]
```

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

-0.043960370525128495

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

```
[-9.57345614  0.80487333 -1.96711447]
```

### Calibration configuration

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Camera model: pinhole  
Focal length: [555.2151620681695, 547.8610219502931]  
Principal point: [451.79533667085366, 266.770343749789]  
Distortion model: radtan  
Distortion coefficients: [-0.09283387524431835, 0.012126965240112251, 0.007514893222842465, 0.01600000000000001, 0.0001234567890123456789]  
Type: aprilgrid  
Tags:  
Rows: 6  
Cols: 6  
Size: 0.088 [m]  
Spacing 0.0023232 [m]

## IMU configuration

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### IMU0:

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Model: calibrated  
Update rate: 240.0  
Accelerometer:

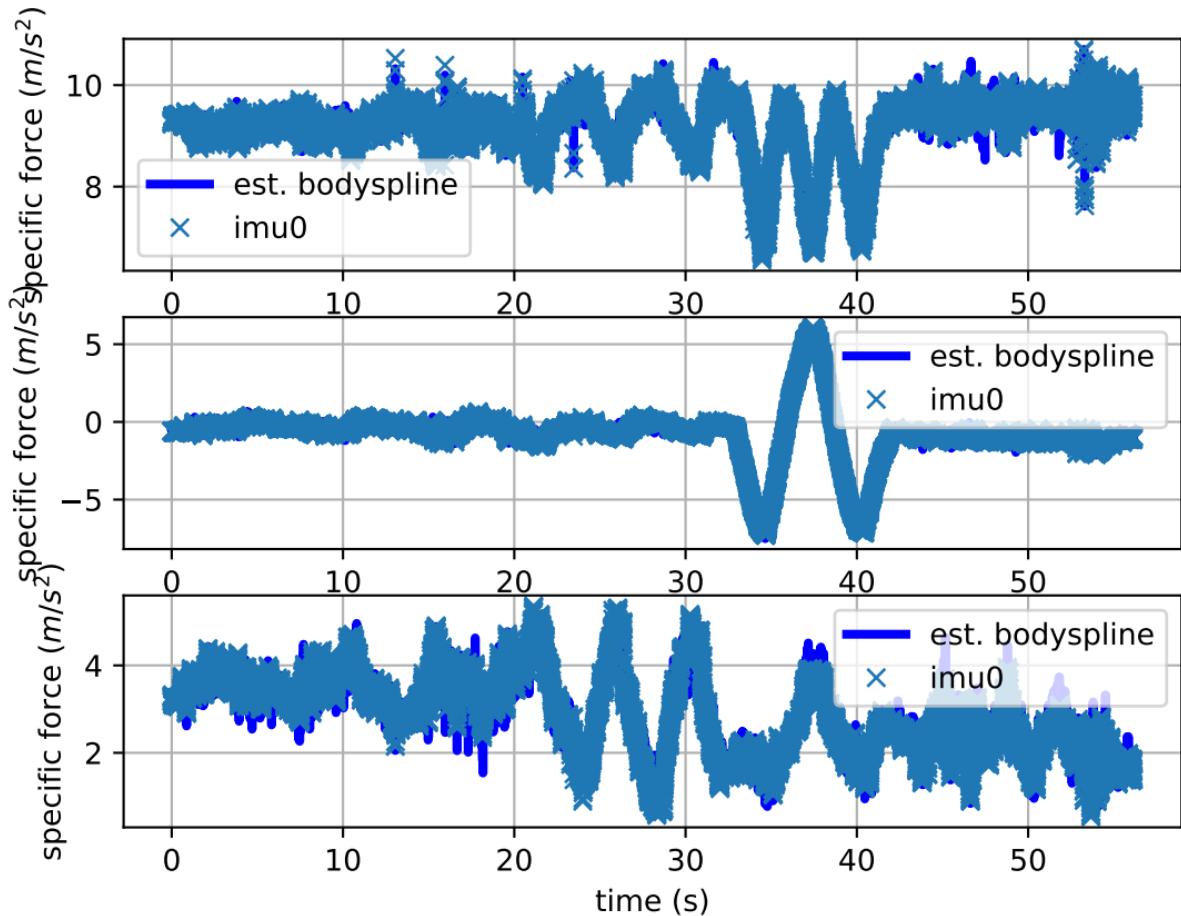
    Noise density: 0.01  
    Noise density (discrete): 0.154919333848  
    Random walk: 0.0002

Gyroscope:  
    Noise density: 0.005  
    Noise density (discrete): 0.0774596669241  
    Random walk: 4e-06

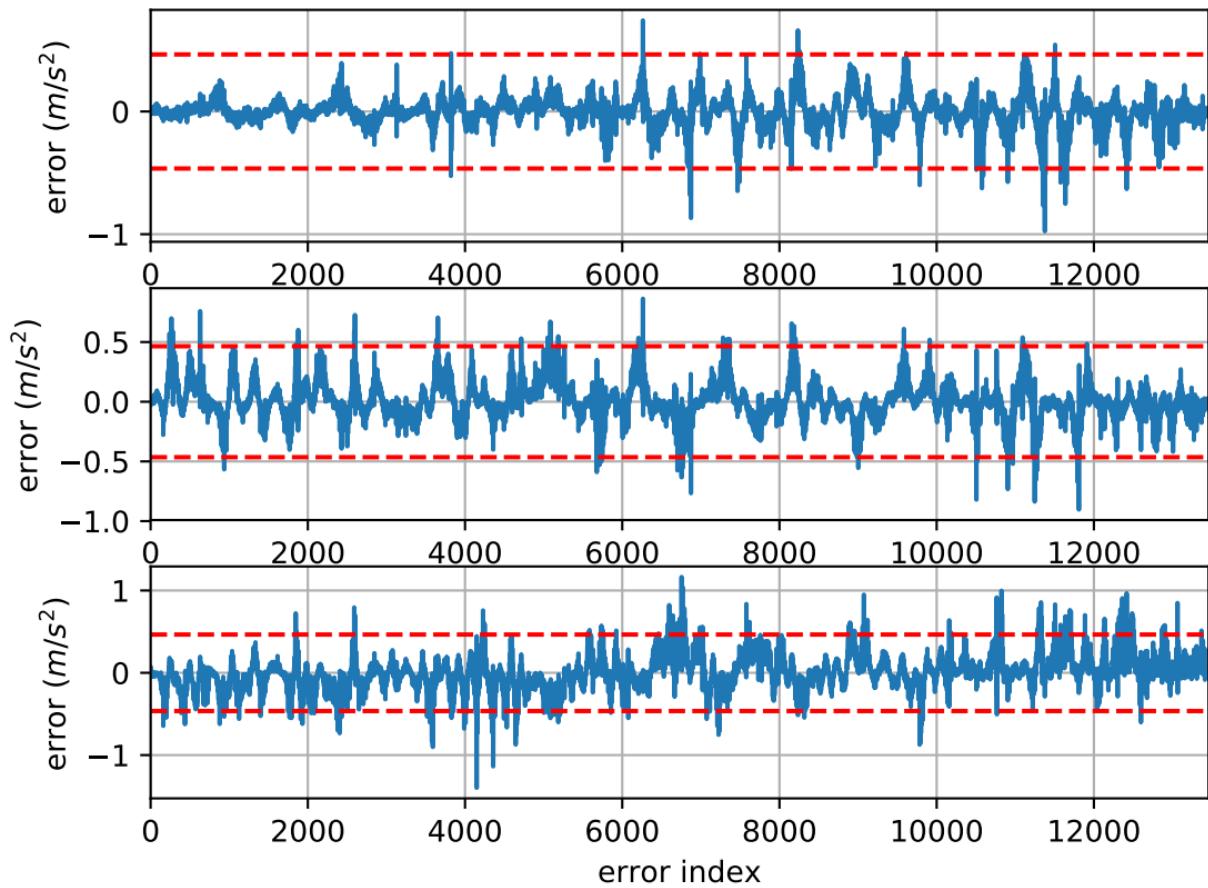
T\_i\_b  
[[1. 0. 0. 0.]  
 [0. 1. 0. 0.]  
 [0. 0. 1. 0.]  
 [0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

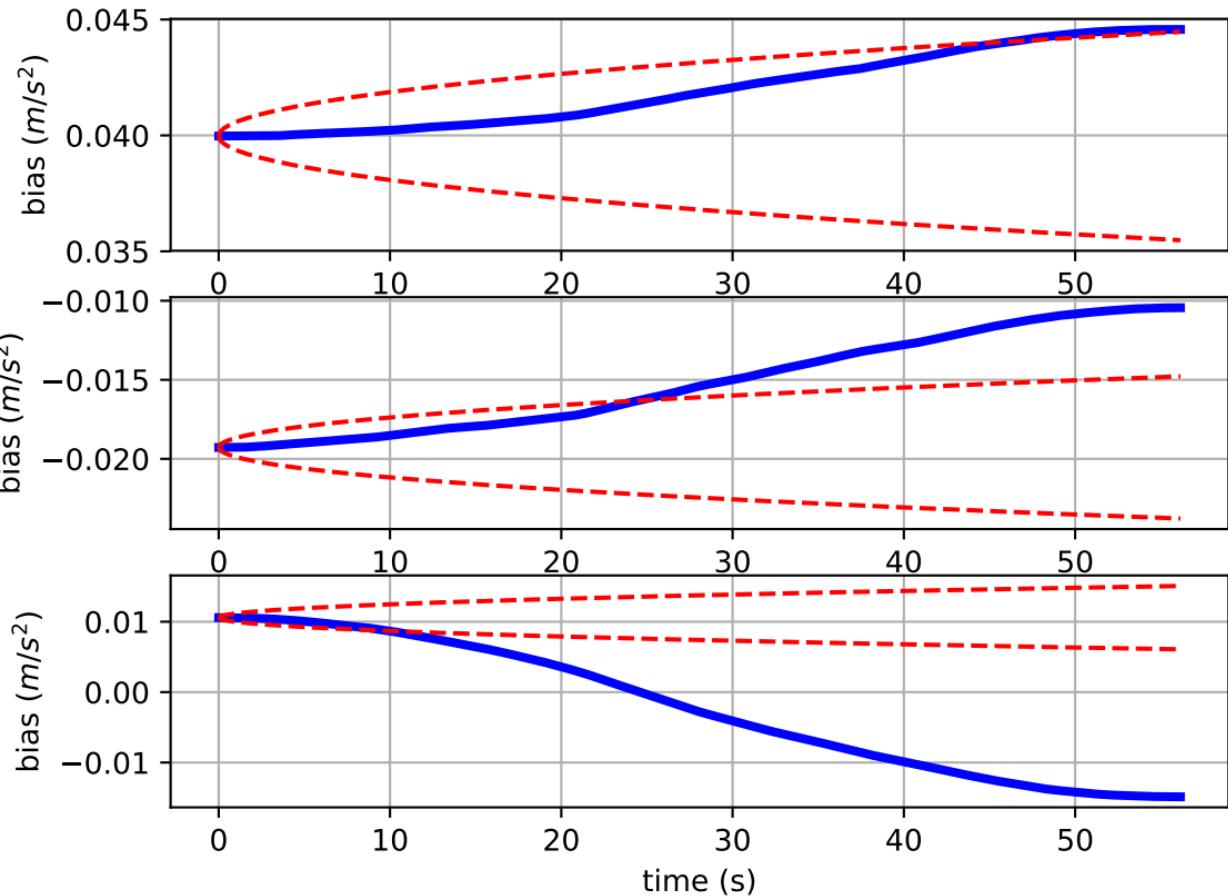
# Comparison of predicted and measured specific force (imu0 frame)



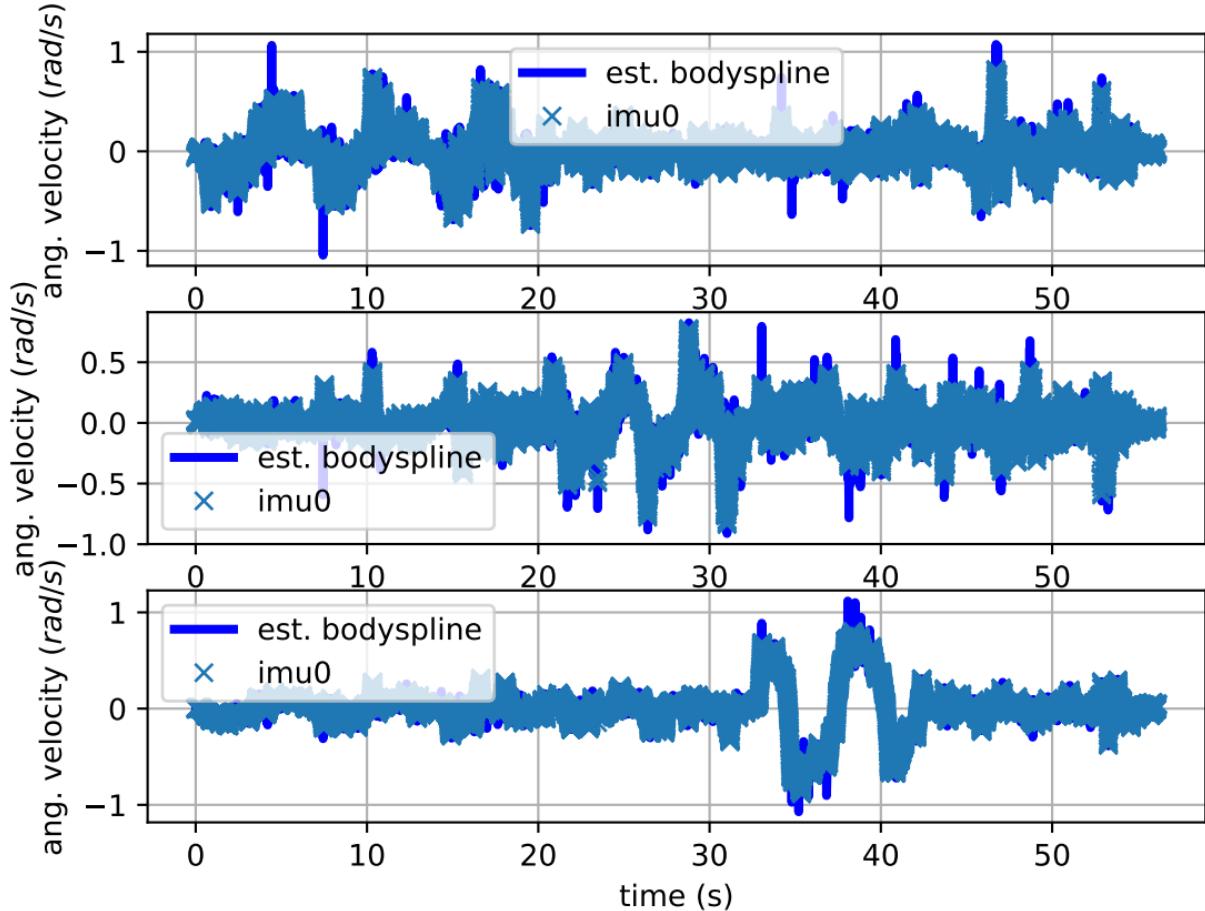
# imu0: acceleration error



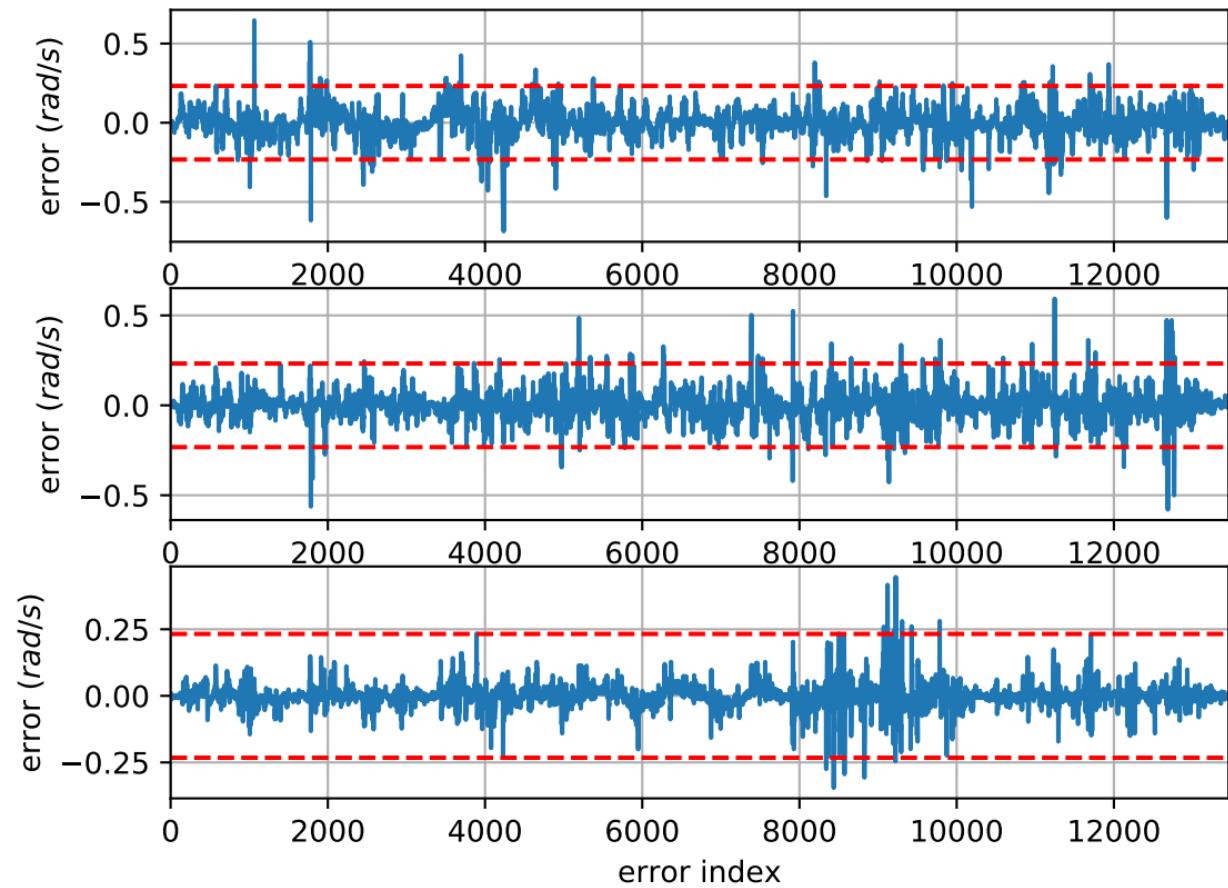
# imu0: estimated accelerometer bias (imu frame)



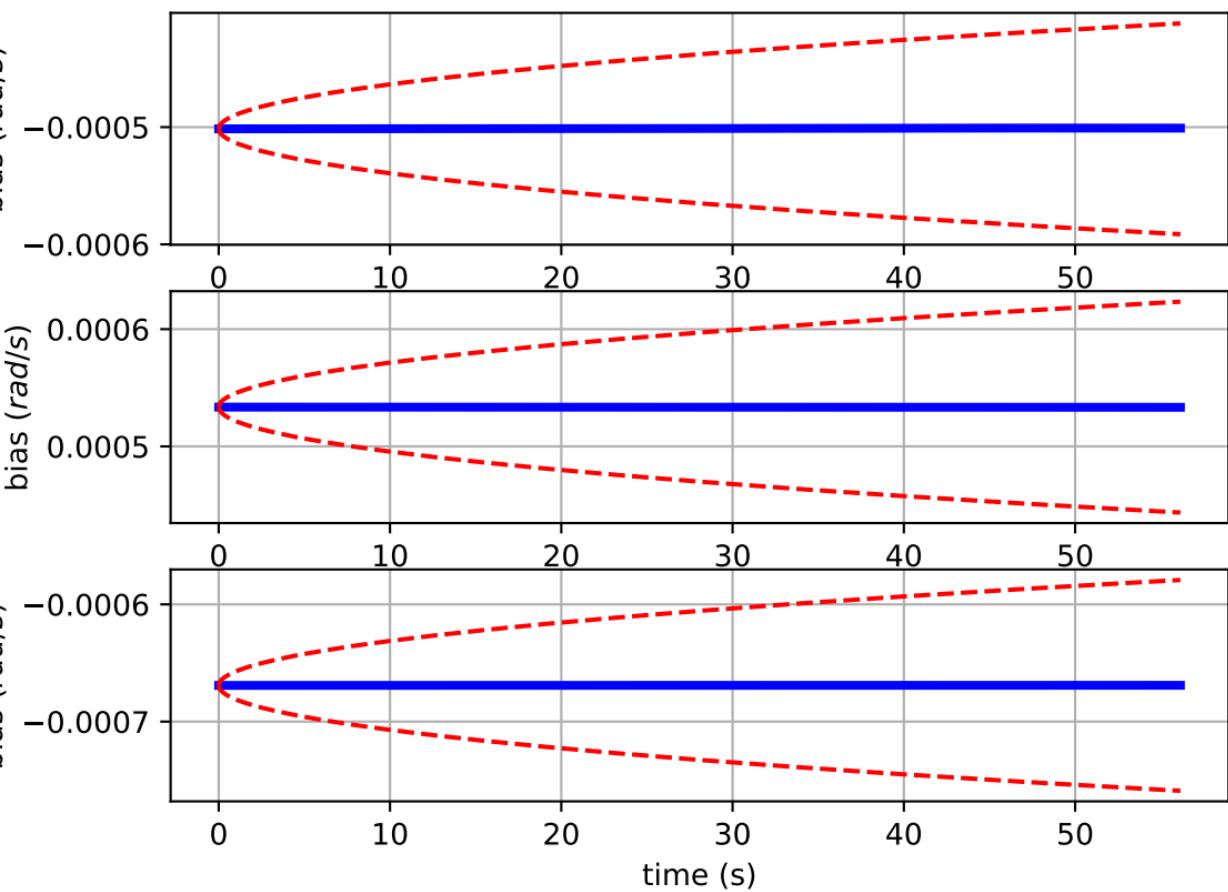
# Comparison of predicted and measured angular velocities (body frame)



# imu0: angular velocities error



# imu0: estimated gyro bias (imu frame)



cam0: reprojection errors

