

## Calibration results

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### Normalized Residuals

Reprojection error (cam0): mean 0.4483728991064746, median 0.3976017138452027, std: 0.2905578050514849  
Gyroscope error (imu0): mean 1.3566153128813818, median 0.8449677623646323, std: 2.2353607946245586  
Accelerometer error (imu0): mean 0.46093685720197436, median 0.2730757042248719, std: 0.7471085519144902

### Residuals

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Reprojection error (cam0) [px]: mean 0.4483728991064746, median 0.3976017138452027, std: 0.2905578050514849  
Gyroscope error (imu0) [rad/s]: mean 0.008767773138925182, median 0.005461006948523301, std: 0.01444708470029583  
Accelerometer error (imu0) [m/s<sup>2</sup>]: mean 0.06517472884950178, median 0.038611872103870765, std: 0.10563832449361843

### Transformation (cam0):

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T\_ci: (imu0 to cam0):

```
[ [ 0.99999713 -0.00184825 0.00152767 -0.03684342]
  [ 0.00184888 0.99999821 -0.00041069 -0.00299989]
  [ -0.00152691 0.00041351 0.99999875 -0.03509502]
  [ 0.          0.          0.          1.          ] ]
```

T\_ic: (cam0 to imu0):

```
[ [ 0.99999713 0.00184888 -0.00152691 0.03679528]
  [ -0.00184825 0.99999821 0.00041351 0.0029463 ]
  [ 0.00152767 -0.00041069 0.99999875 0.03515003]
  [ 0.          0.          0.          1.          ] ]
```

timeshift cam0 to imu0: [s] ( $t_{imu} = t_{cam} + \text{shift}$ )

0.00017127300362964996

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

[-0.17808416 -9.80314146 -0.18742031]

## Calibration configuration

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cam0

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Camera model: omni

Focal length: [723.6934694284747, 721.9892745624265]

Principal point: [642.1143504018181, 361.659760780821]

Omni xi: 0.13514611682595576

Distortion model: radtan

Distortion coefficients: [0.009673119232081117, 0.040663307889465365, -0.0029377041686993034, 0.0026523658681364237]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.088 [m]

Spacing 0.026399999999999996 [m]

## IMU configuration

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IMU0:

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Model: calibrated

Update rate: 200.0

Accelerometer:

Noise density: 0.009998222535561607

Noise density (discrete): 0.1413962190941554

Random walk: 0.0010572240682889056

Gyroscope:

Noise density: 0.00045700146412701916

Noise density (discrete): 0.00646297668592792

Random walk: 2.672307981517485e-06

T\_ib (imu0 to imu0)

[[1. 0. 0. 0.]

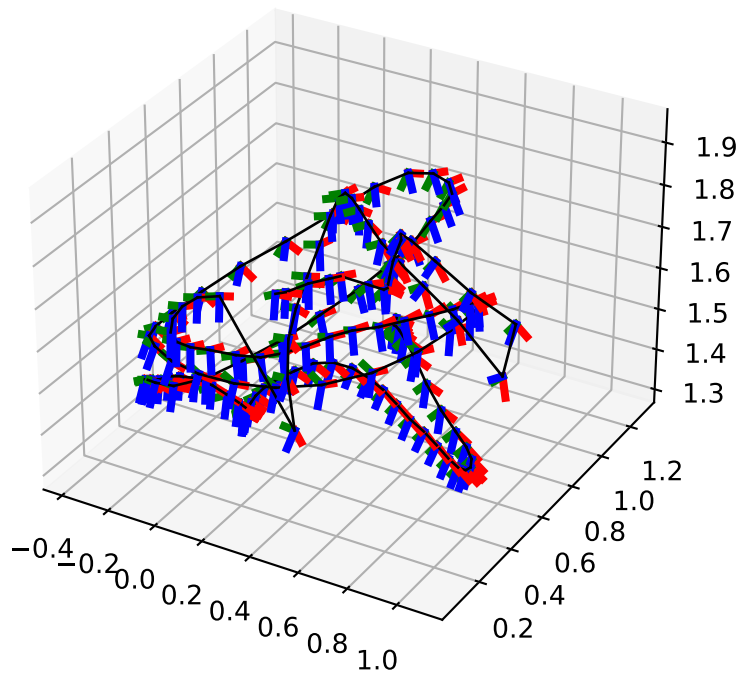
[0. 1. 0. 0.]

[0. 0. 1. 0.]

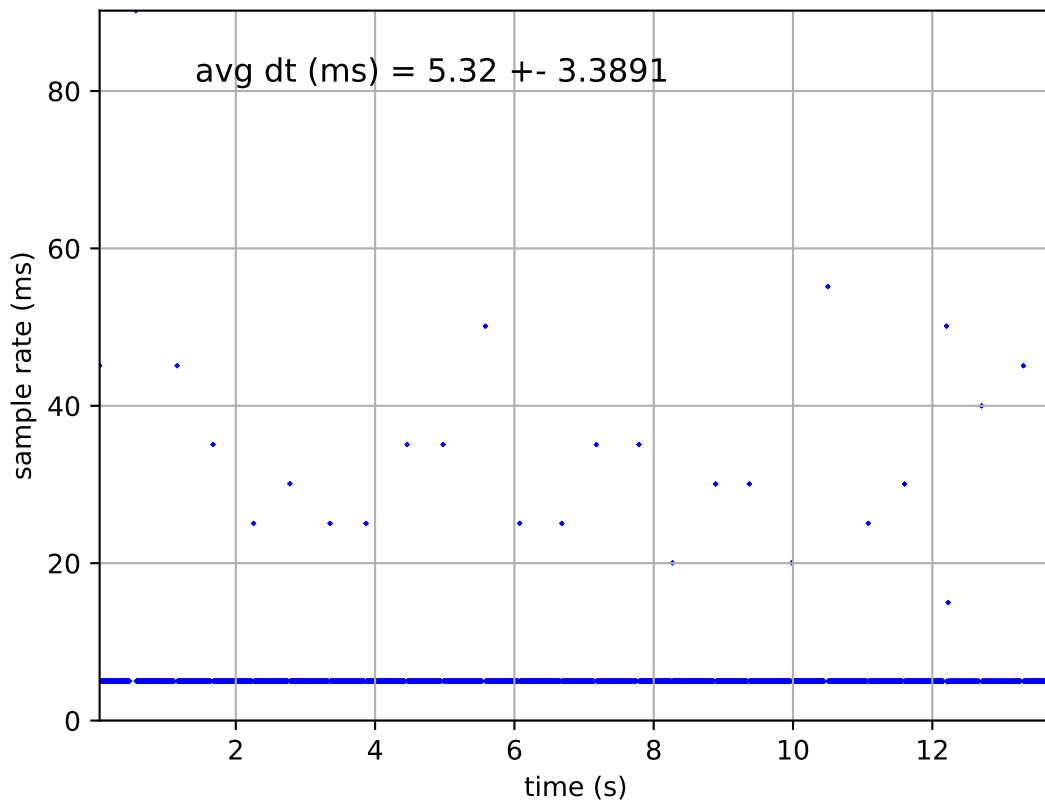
[0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

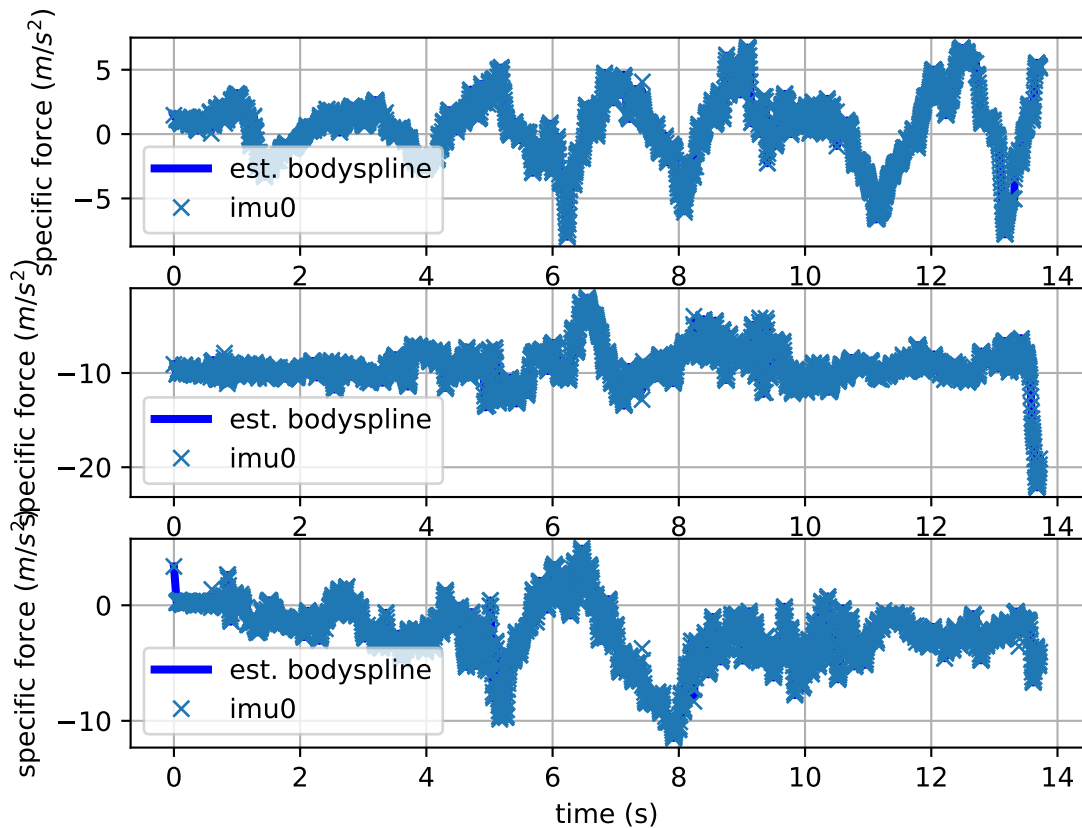
imu0: estimated poses



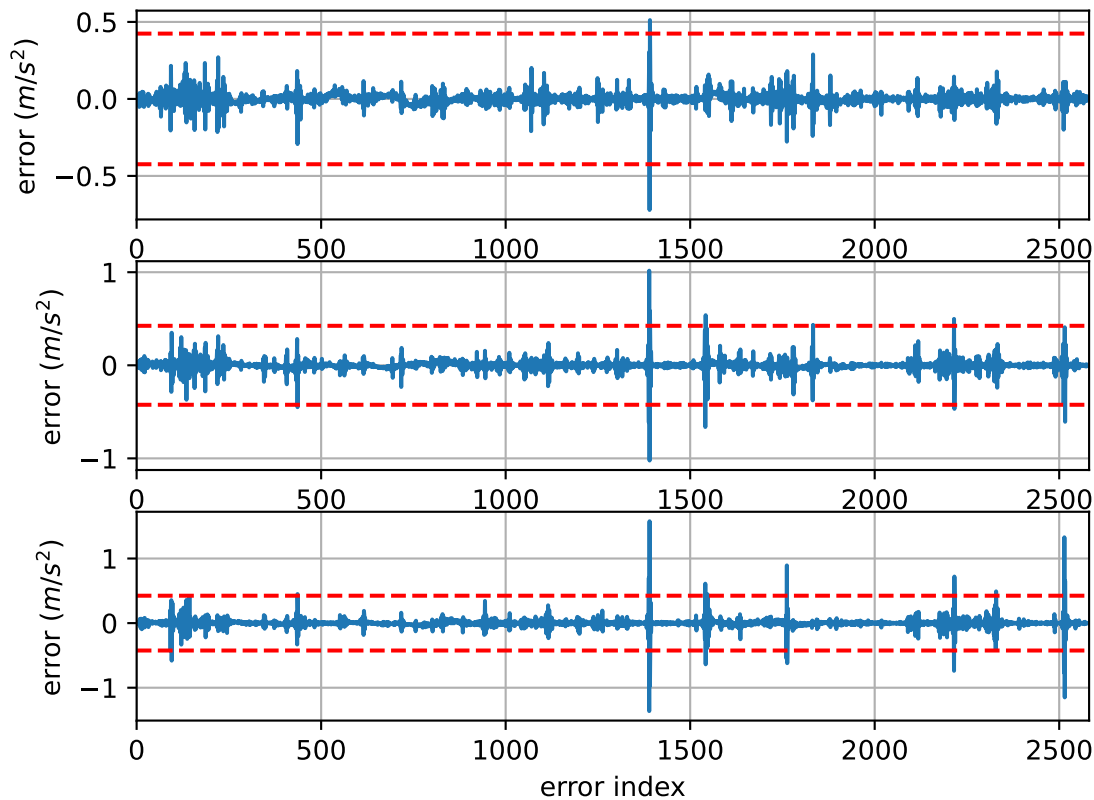
imu0: sample inertial rate



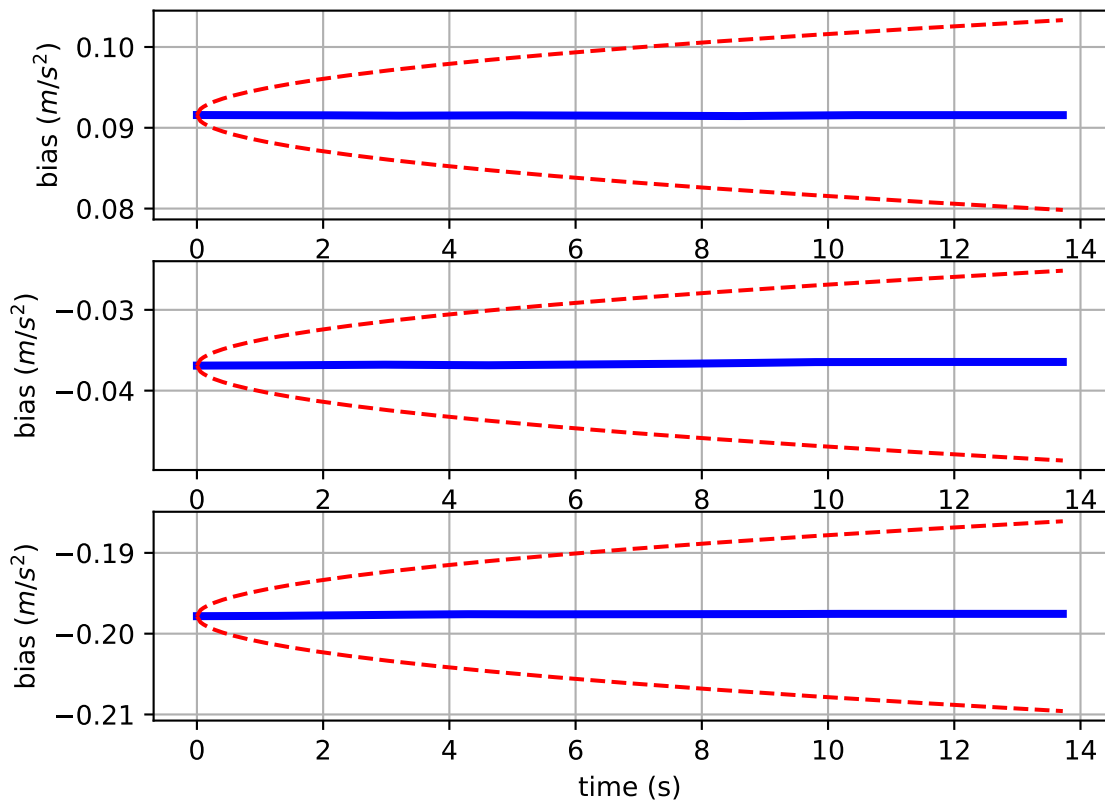
Comparison of predicted and measured specific force (imu0 frame)



imu0: acceleration error

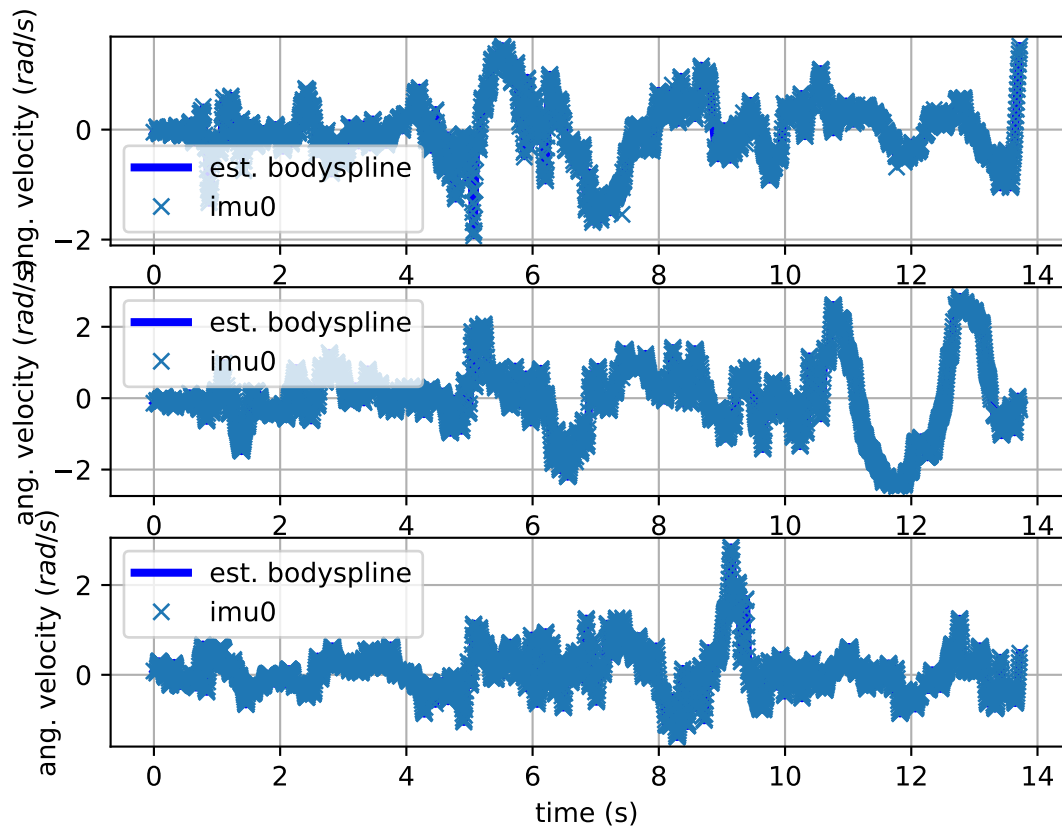


imu0: estimated accelerometer bias (imu frame)

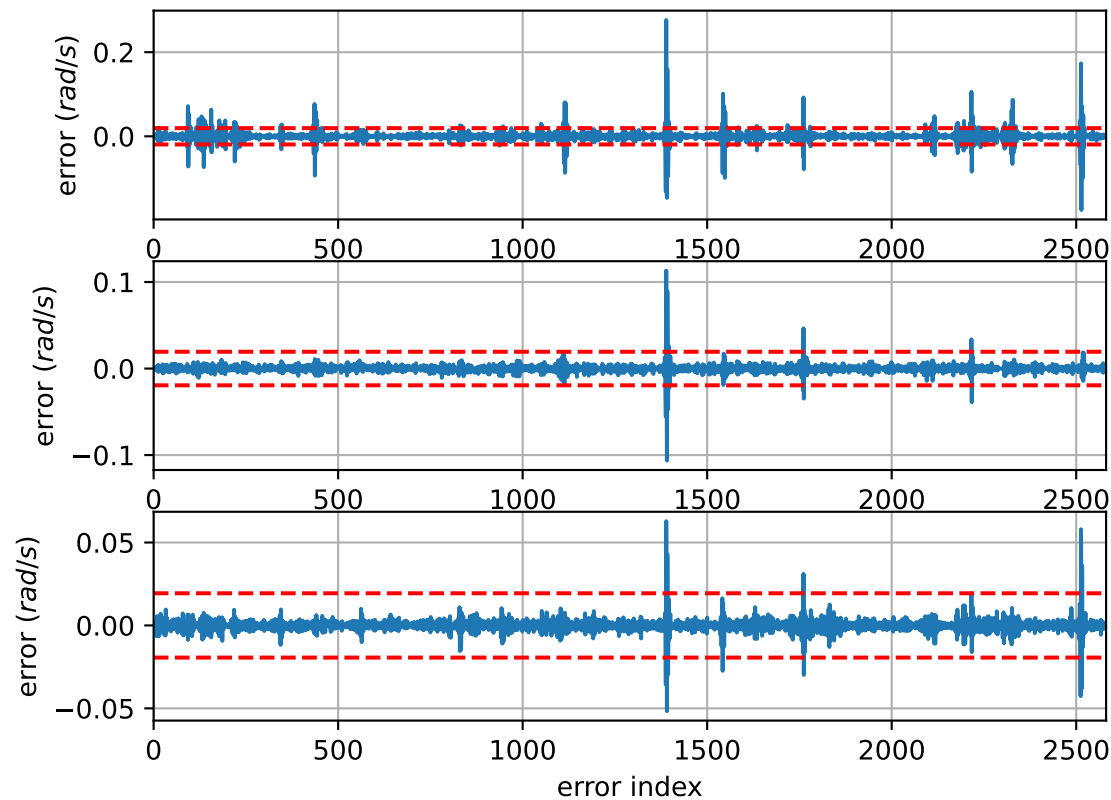




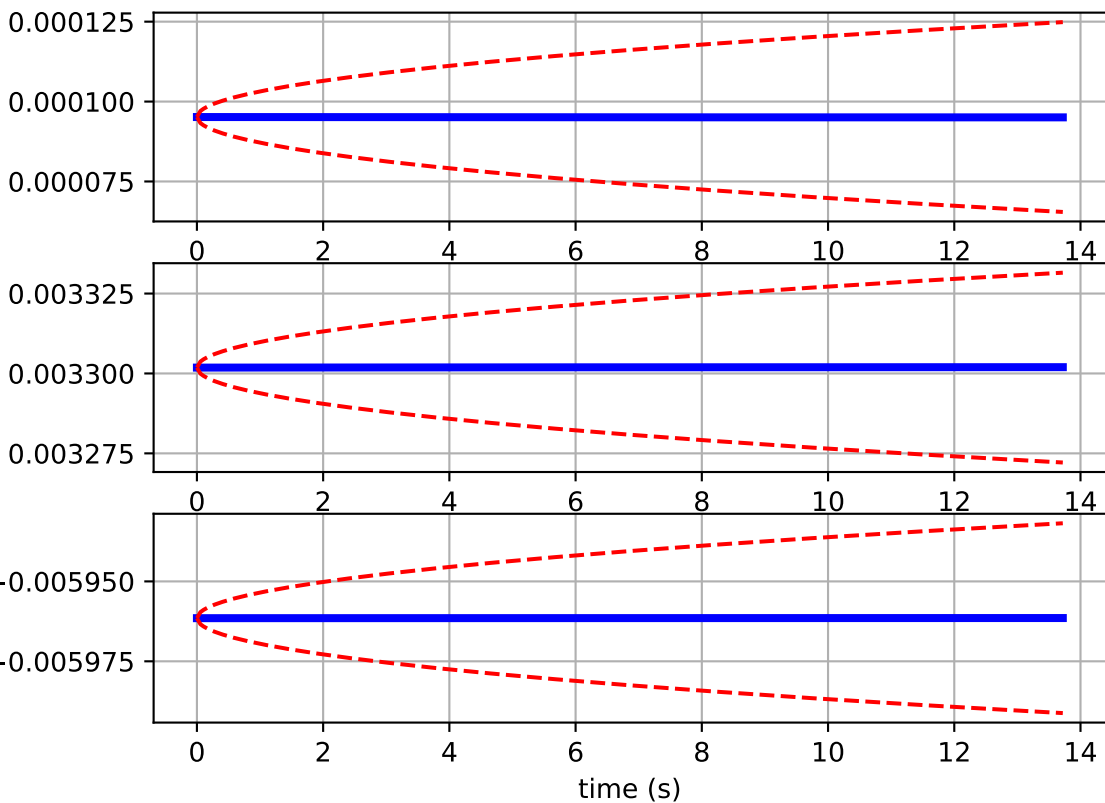
Comparison of predicted and measured angular velocities (body frame)



imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors

