

## Calibration results

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### Normalized Residuals

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Reprojection error (cam0): mean 0.3793167599650975, median 0.32133300178889007, std: 0.26483310

Gyroscope error (imu0): mean 8.832152263850019e-07, median 8.250814612511075e-10, std: 3.57074

Accelerometer error (imu0): mean 1.6979513464348398e-06, median 5.147807898875706e-09, std: 4.919

### Residuals

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Reprojection error (cam0) [px]: mean 0.3793167599650975, median 0.32133300178889007, std: 0.26483

Gyroscope error (imu0) [rad/s]: mean 3.6244952342373406e-10, median 3.385928746272125e-13, std: 1

Accelerometer error (imu0) [m/s^2]: mean 1.7962817125945277e-08, median 5.4459235290314296e-11, st

### Transformation (cam0):

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T\_ci: (imu0 to cam0):

[[ -0.01035535 -0.9999383 0.00401967 0.00003504]

[ -0.46533134 0.00126079 -0.88513567 -0.00022989]

[ 0.88507599 -0.01103637 -0.46531569 -0.00006766]

[ 0. 0. 0. 1. ]]

T\_ic: (cam0 to imu0):

[[ -0.01035535 -0.46533134 0.88507599 -0.00004673]

[ -0.9999383 0.00126079 -0.01103637 0.00003458]

[ 0.00401967 -0.88513567 -0.46531569 -0.00023511]

[ 0. 0. 0. 1. ]]

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

-0.051552411404800456

Gravity vector in target coords: [m/s^2]

[-0.76474178 -9.76801142 -0.41175943]

Calibration configuration

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Camera model: pinhole  
Focal length: [461.0204449258414, 458.63956688957865]  
Principal point: [344.8380247856544, 256.7844928550531]  
Distortion model: radtan  
Distortion coefficients: [0.007525517032582946, 0.016907218189922118, 5.795374623966506e-05, 0.006907218189922118, 0.00012345678901234567]  
Type: aprilgrid  
Tags:  
 Rows: 5  
 Cols: 8  
 Size: 0.06 [m]  
 Spacing 0.015 [m]

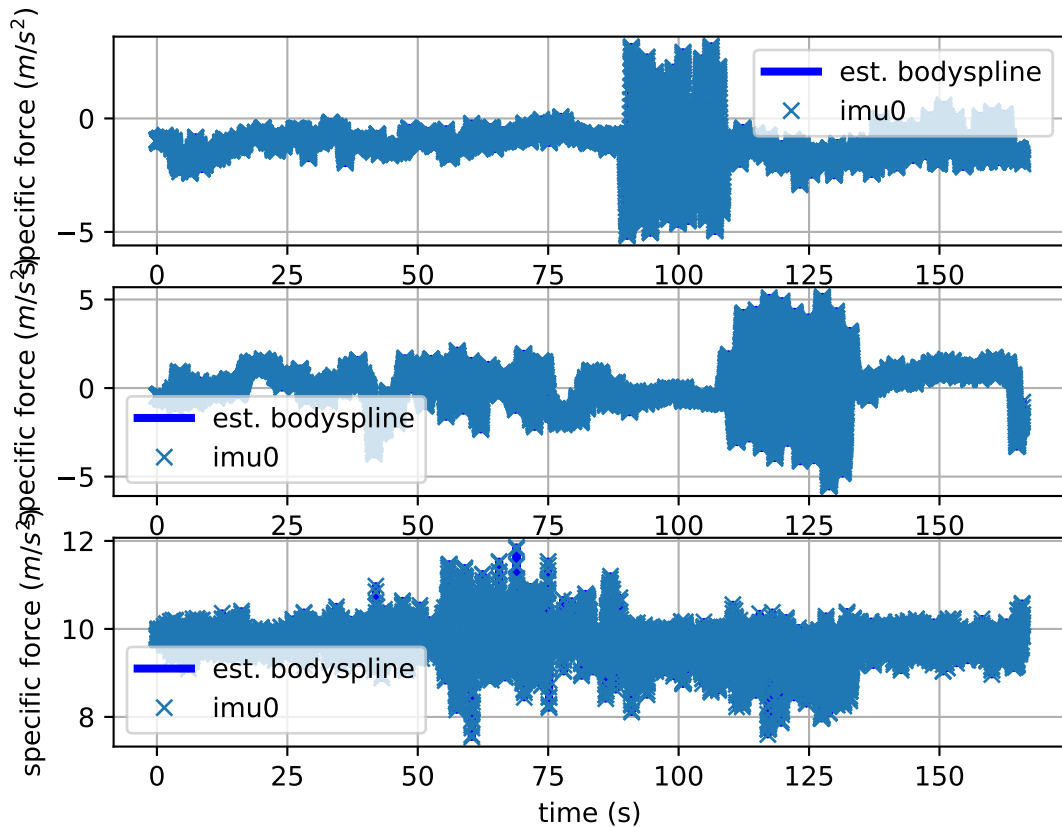
#### IMU configuration

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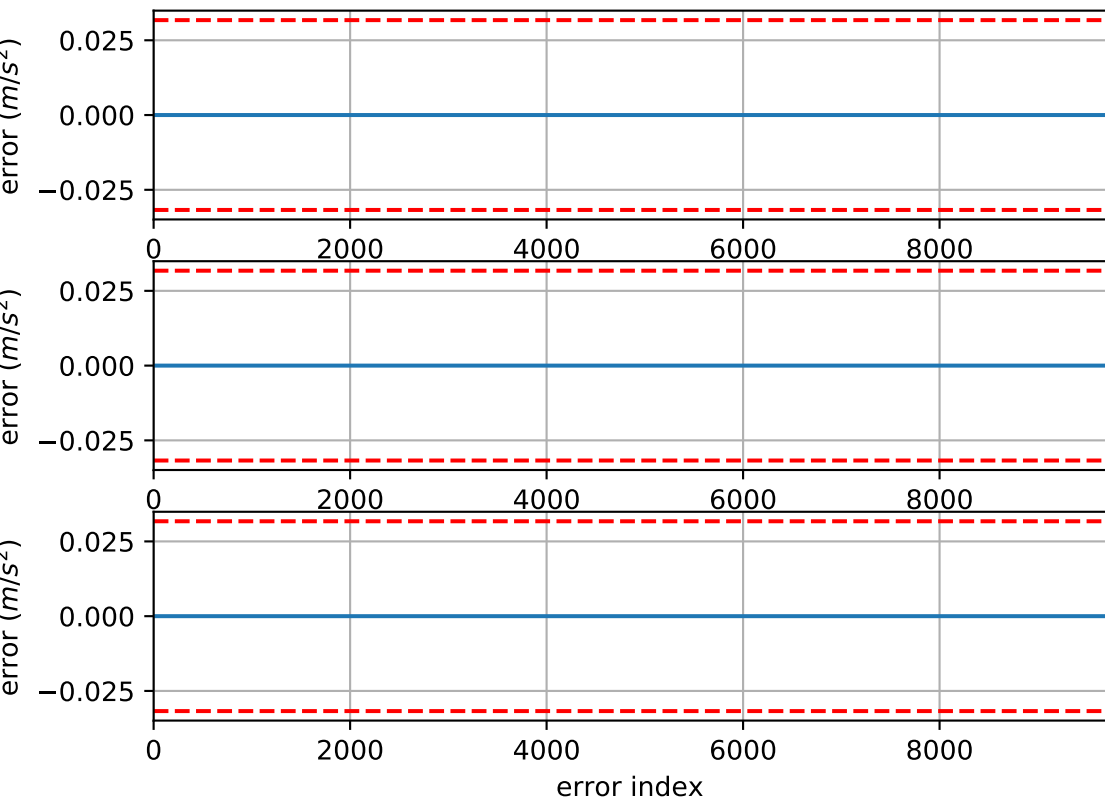
#### IMU0:

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Model: calibrated  
Update rate: 30  
Accelerometer:  
 Noise density: 0.0019314727238559915  
 Noise density (discrete): 0.010579111800618731  
 Random walk: 0.00024369423344425823  
Gyroscope:  
 Noise density: 7.492389699421491e-05  
 Noise density (discrete): 0.0004103750847992502  
 Random walk: 4.253266741725987e-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]

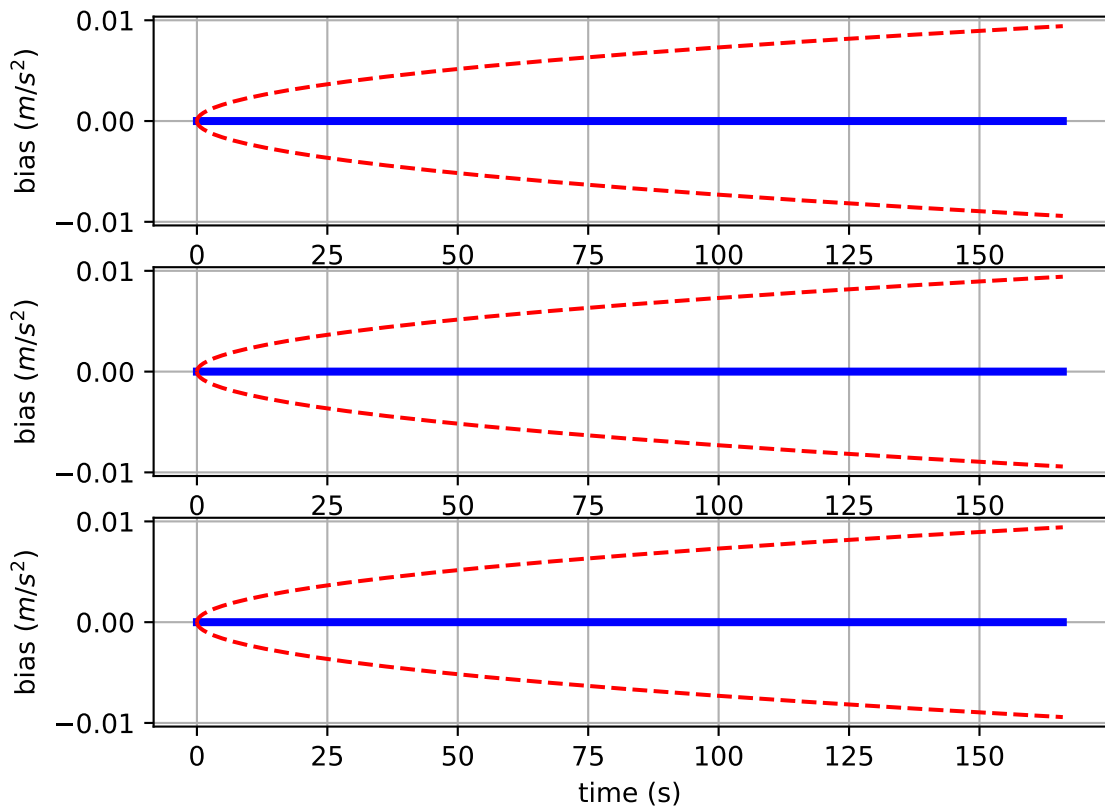
Comparison of predicted and measured specific force (imu0 frame)



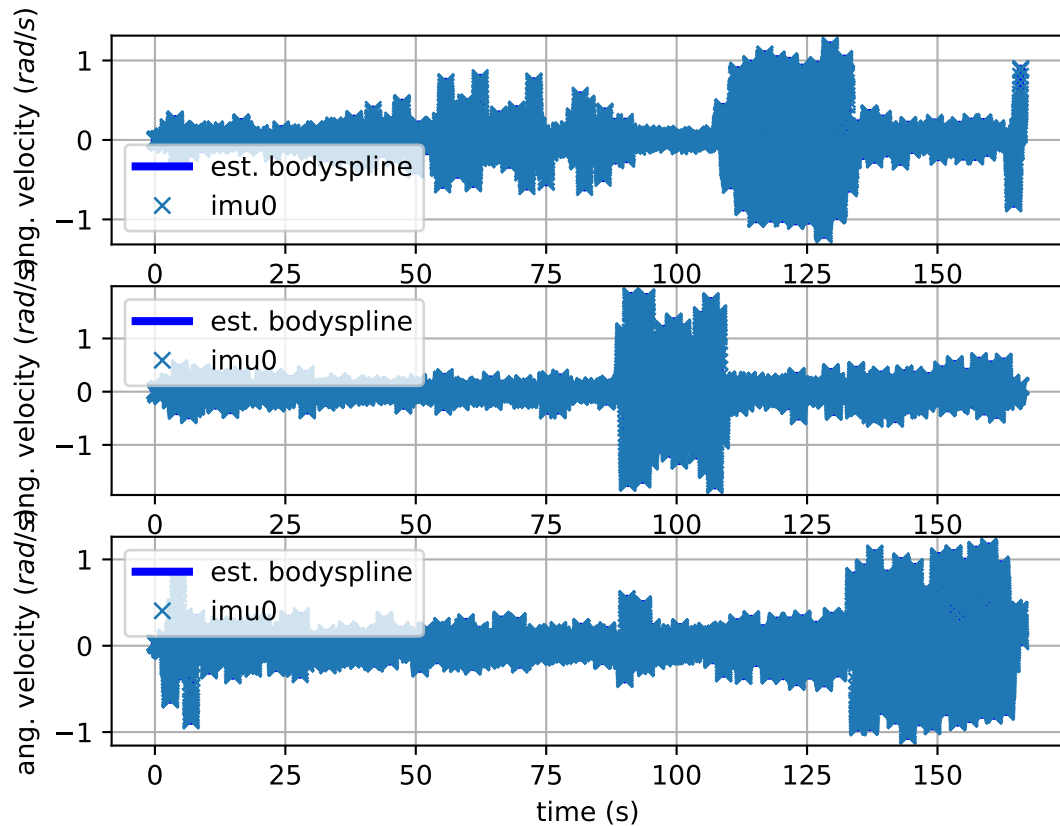
imu0: acceleration error



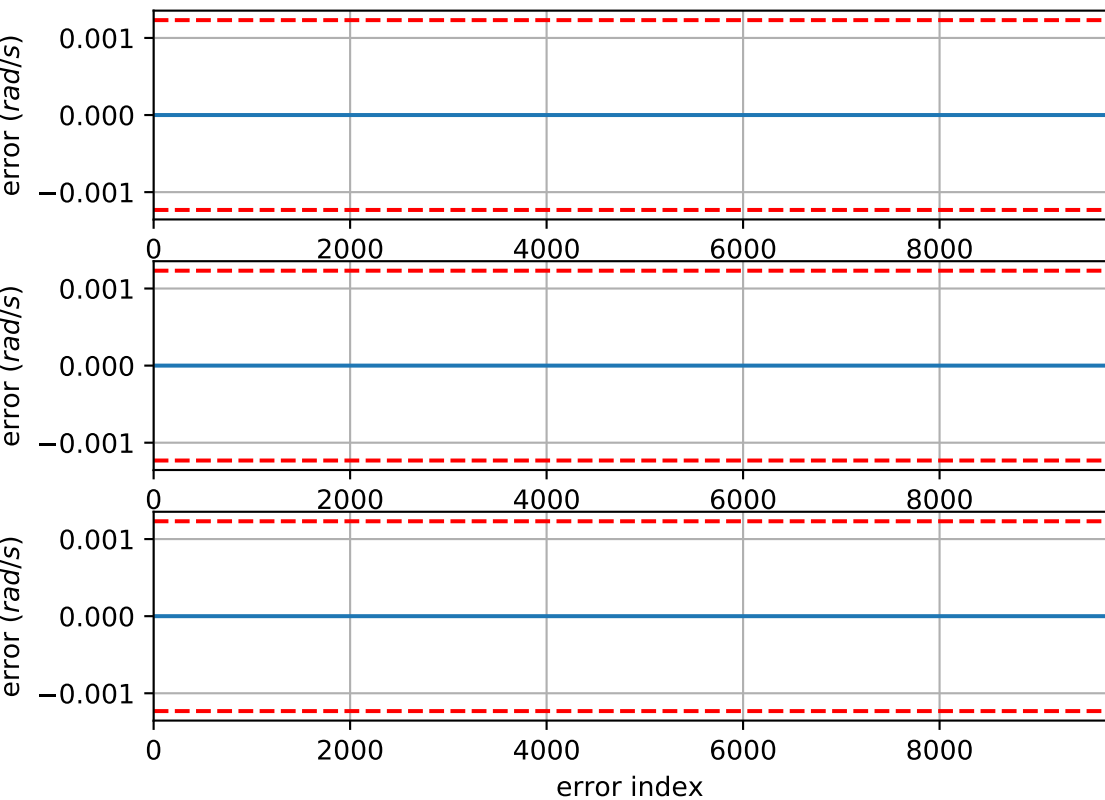
imu0: estimated accelerometer bias (imu frame)



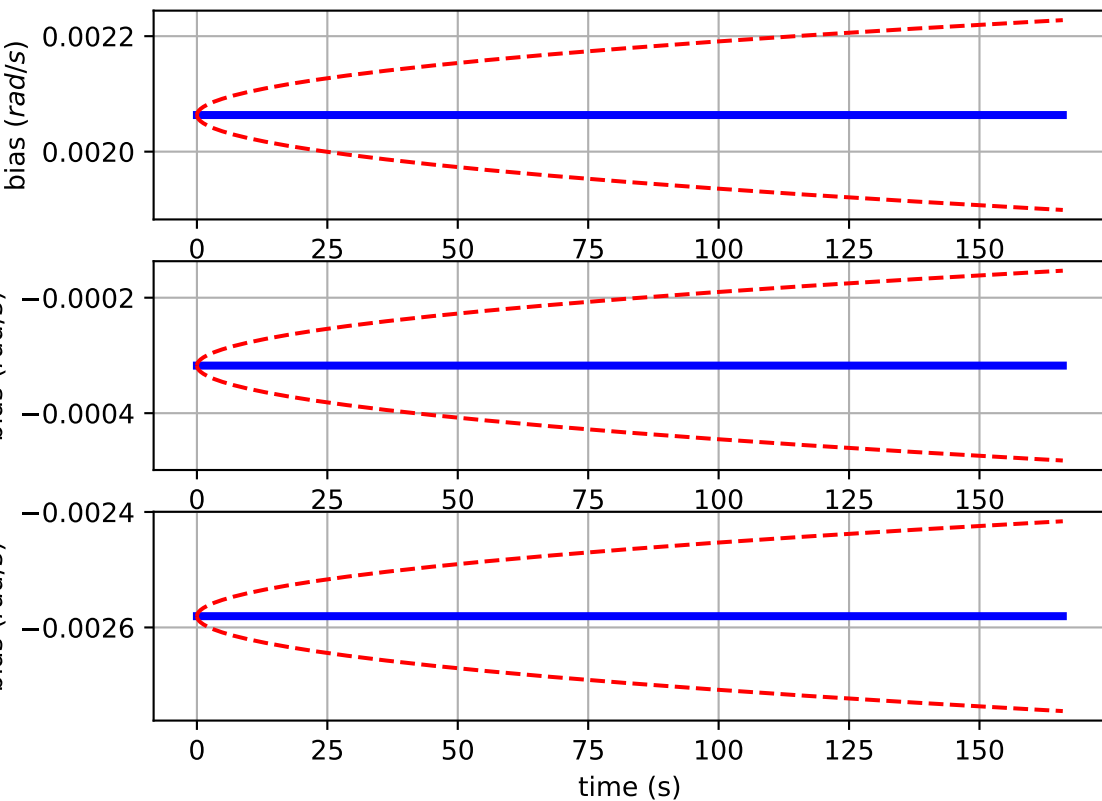
Comparison of predicted and measured angular velocities (body frame)



imu0: angular velocities error



imu0: estimated gyro bias (imu frame)





cam0: reprojection errors

