

Calibration results

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Normalized Residuals

Reprojection error (cam0): mean 20.323089820536662, median 12.165793620476165, std: 26.970837213835154
Gyroscope error (imu0): mean 1.2972412645620413, median 0.15627272075816862, std: 6.102788688839148
Accelerometer error (imu0): mean 1.0551641551923365, median 1.024879250377895, std: 0.22101048798818065

Residuals

Reprojection error (cam0) [px]: mean 20.323089820536662, median 12.165793620476165, std: 26.970837213835154
Gyroscope error (imu0) [rad/s]: mean 0.0014218083831867437, median 0.00017127875169186687, std: 0.006688806743700185
Accelerometer error (imu0) [m/s^2]: mean 0.011335327523840371, median 0.01100998543046965, std: 0.002374252627159383

Transformation (cam0):

T_ci: (imu0 to cam0):

[[0.66797687 -0.48081744 0.56799779 0.02926364]
[0.06998033 -0.71928457 -0.69118193 -0.28898885]
[0.74088438 0.50144222 -0.44681769 0.40013491]
[0. 0. 0. 1.]]

T_ic: (cam0 to imu0):

[[0.66797687 0.06998033 0.74088438 -0.2957776]
[-0.48081744 -0.71928457 0.50144222 -0.39443929]
[0.56799779 -0.69118193 -0.44681769 -0.0375782]
[0. 0. 0. 1.]]

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

5.7941009391430995

Gravity vector in target coords:

[m/s^2] [-3.26976878 -7.40478669
5.53589823]

Calibration configuration

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cam0

Camera model: pinhole

Focal length: [210.24118591854983, 211.4846805698751]

Principal point: [318.51182284207556, 252.48457990317036]

Distortion model: equidistant

Distortion coefficients: [0.19941623511989434, -0.20736409267316344, 0.0007040531507409564, 0.0008060182732909919]

Type: aprilgrid

Tags:

Rows: 6

Cols: 6

Size: 0.088 [m]

Spacing 0.02639999999999996 [m]

IMU configuration

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IMU0:

Model: calibrated

Updaterate:100.0

Accelerometer:

Noise density: 0.001284

Noise density (discrete): 0.01074271474069753

Random walk: 0.000209

Gyroscope:

Noise density: 0.000131

Noise density (discrete): 0.001096024634759639

Random walk: 3e-06

T_ib (imu0 to imu0)

[[1. 0. 0. 0.]

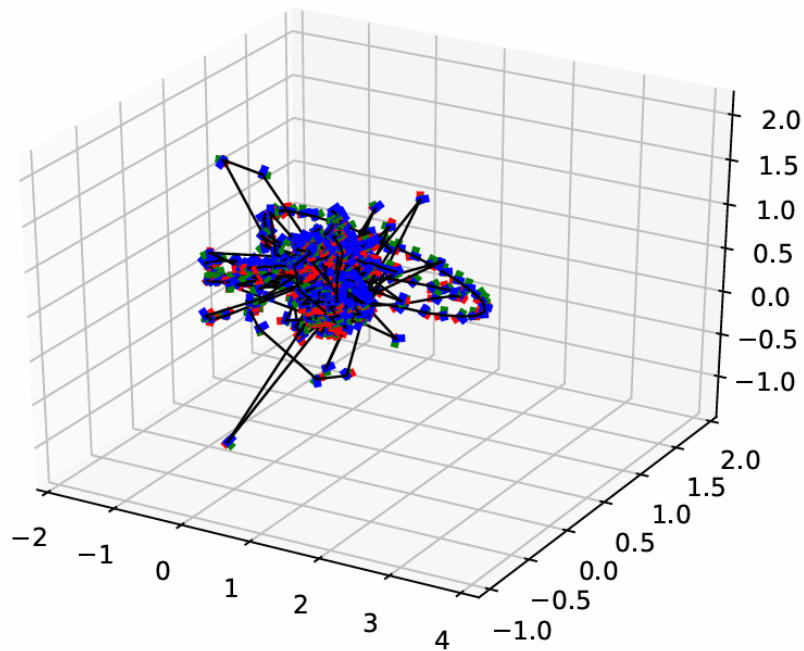
[0. 1. 0. 0.]

[0. 0. 1. 0.]

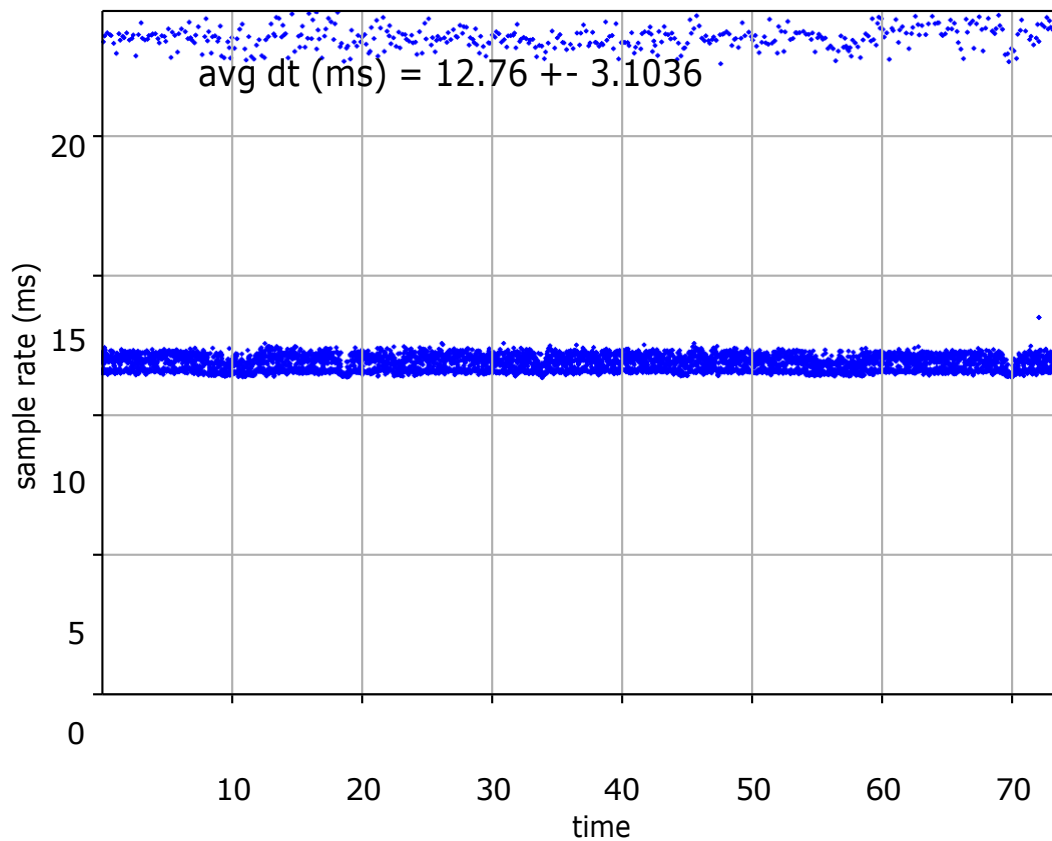
[0. 0. 0. 1.]]

time offset with respect to IMU0: 0.0 [s]

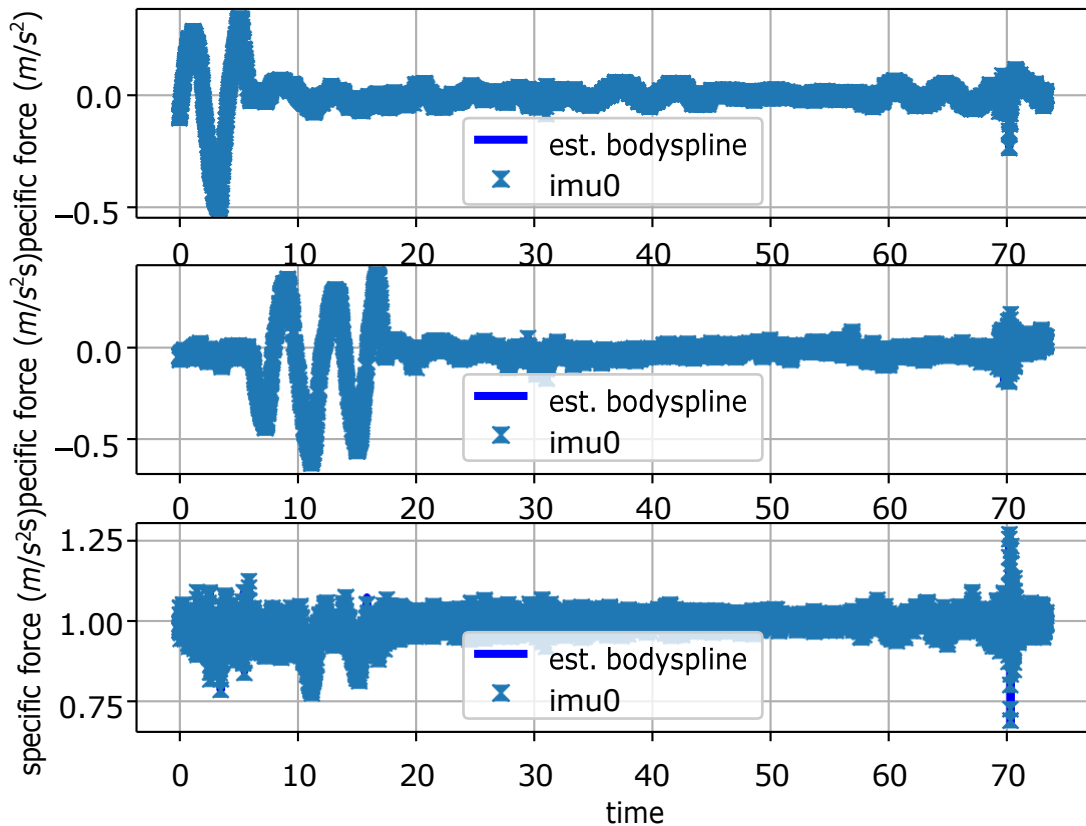
imu0: estimated poses



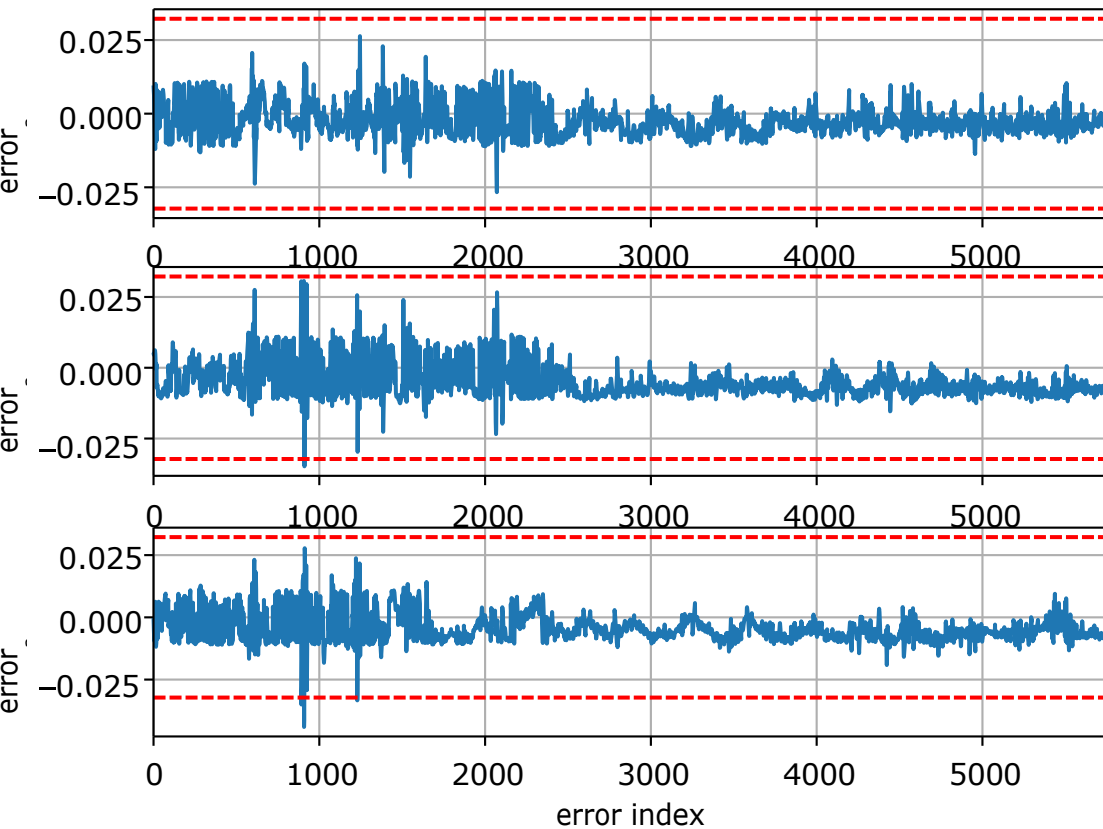
imu0: sample inertial rate



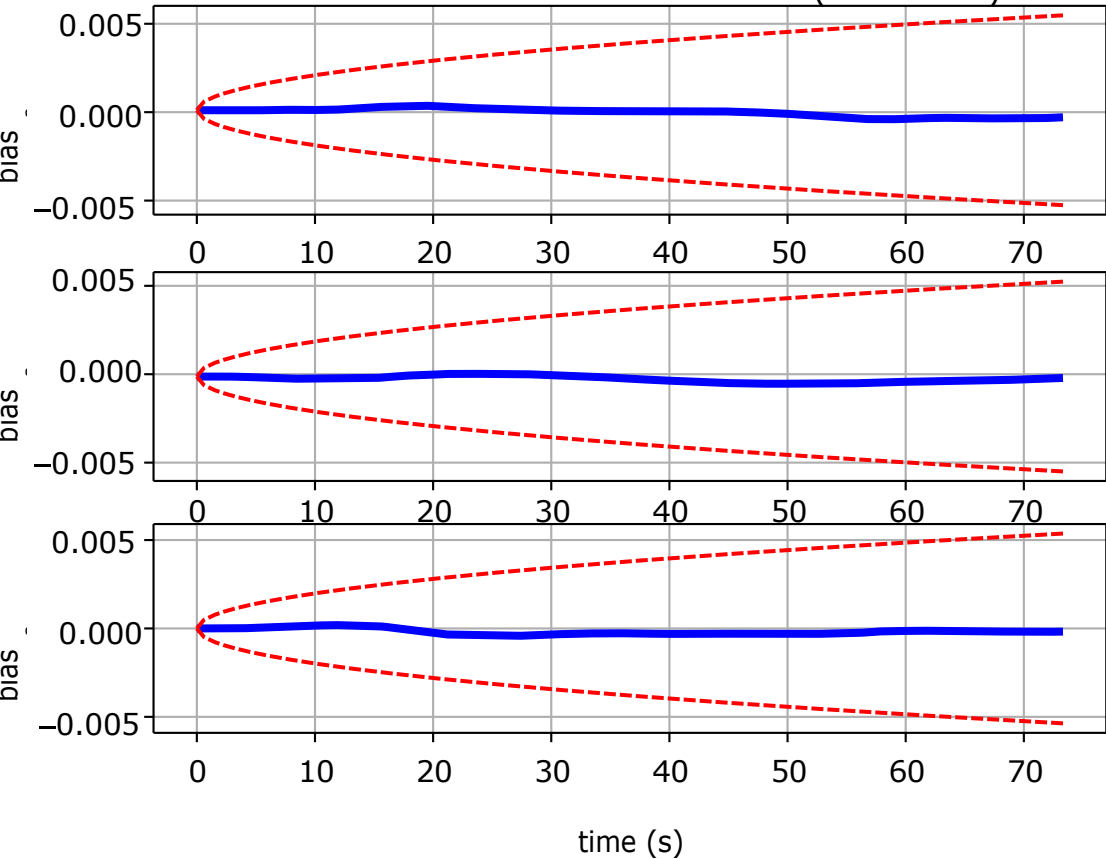
Comparison of predicted and measured specific force (imu0 frame)

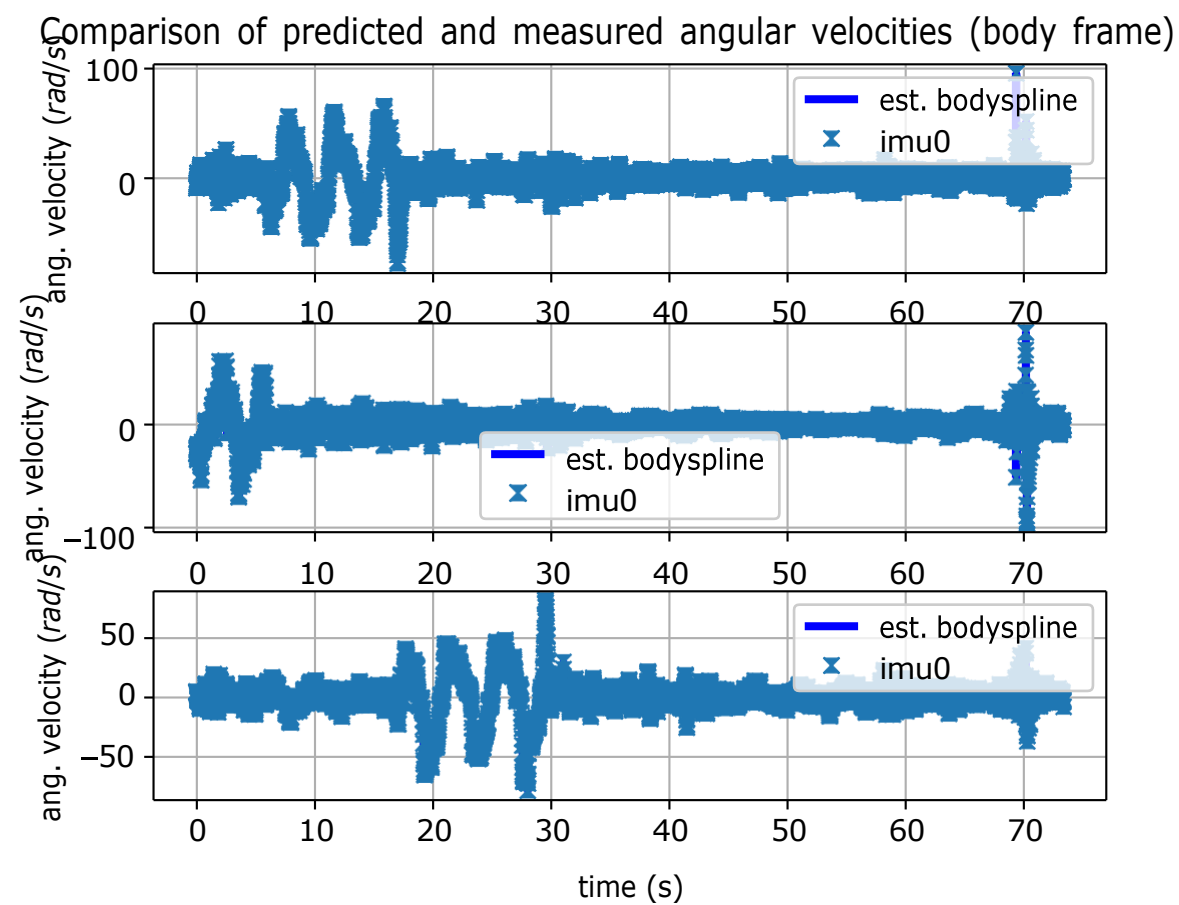


imu0: acceleration error

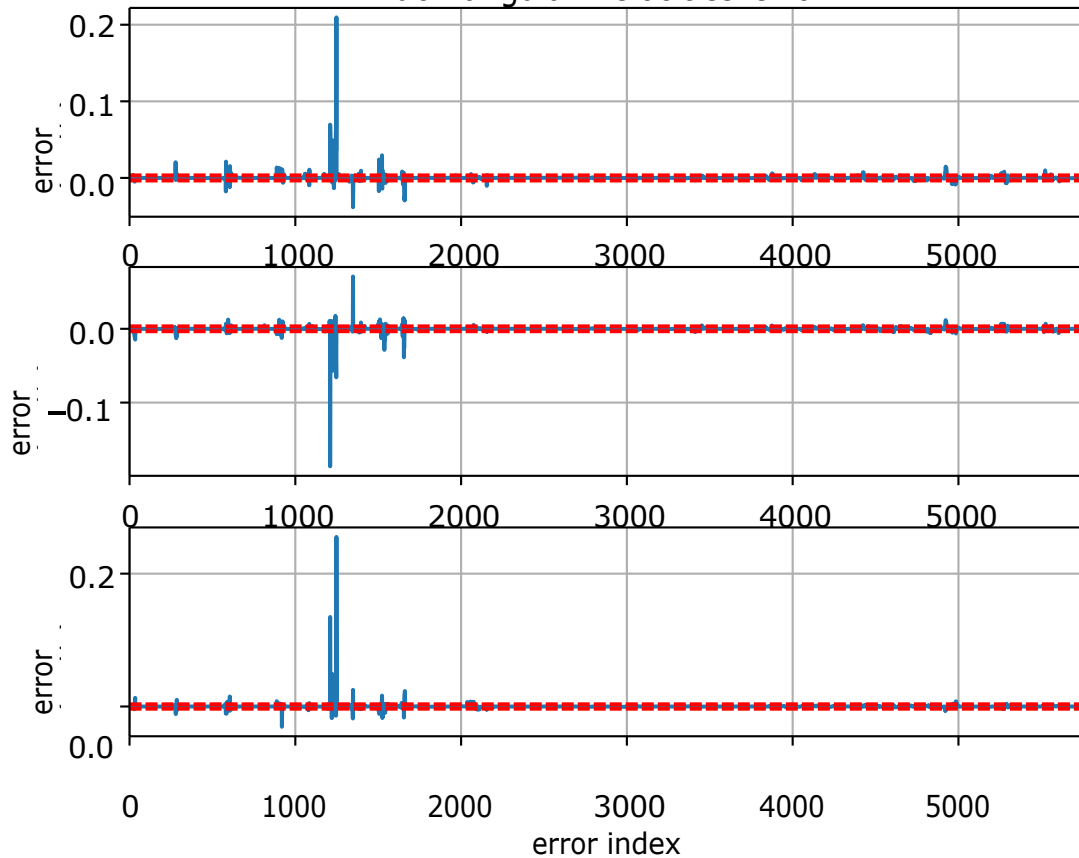


imu0: estimated accelerometer bias (imu frame)

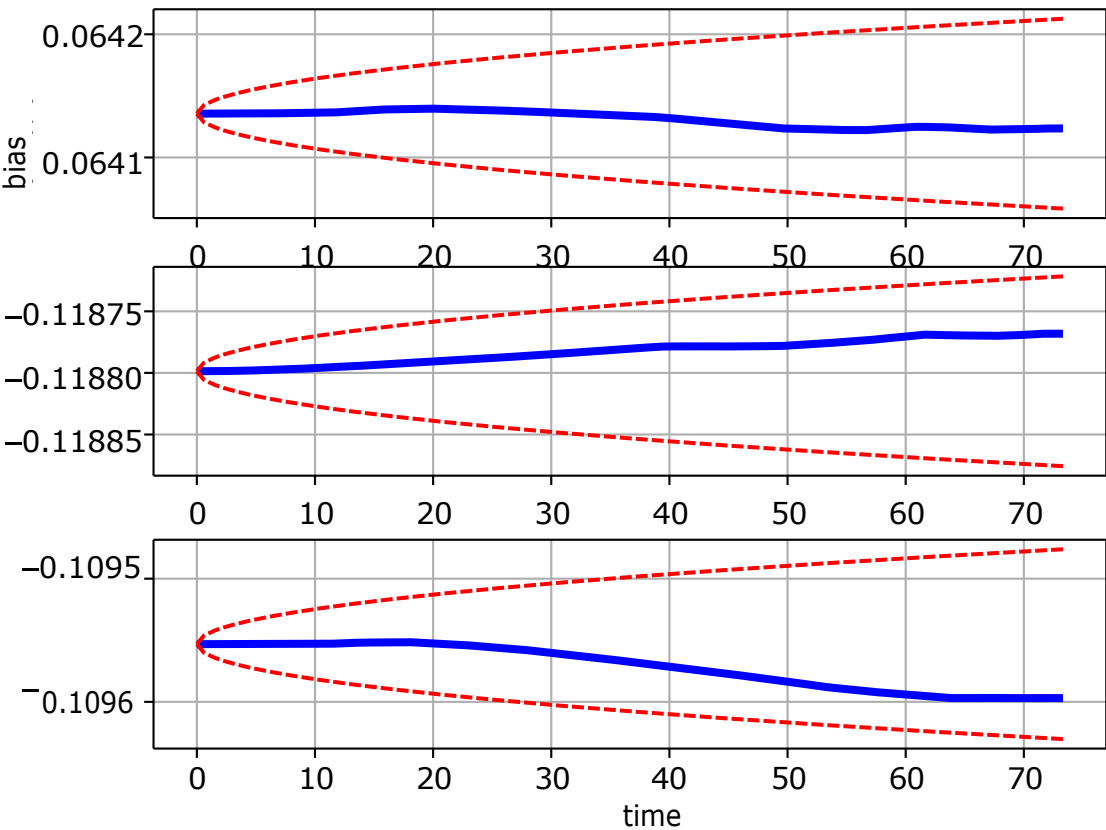




imu0: angular velocities error



imu0: estimated gyro bias (imu frame)



cam0: reprojection errors

