

Comparison of MIDG and MNAV data: Static test

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1 Background

The objective is to compare the Crossbow Micronav sensor attitude solution to that of Microboticsinc MIDG II INS. Figure 1 shows the setup of the 2 sensor units on the Unicorn UAV. The sampling rate of the data is done at 50 HZ. The data is collect on the ground(static run) with the rolling, pitching and yawing motion applied. To synchronize the data between the 2 sensors, the UAV is first rotated 90 deg in each of the axis so that the accelerometer output signals are used to get the time offset between the 2 sensors signal.

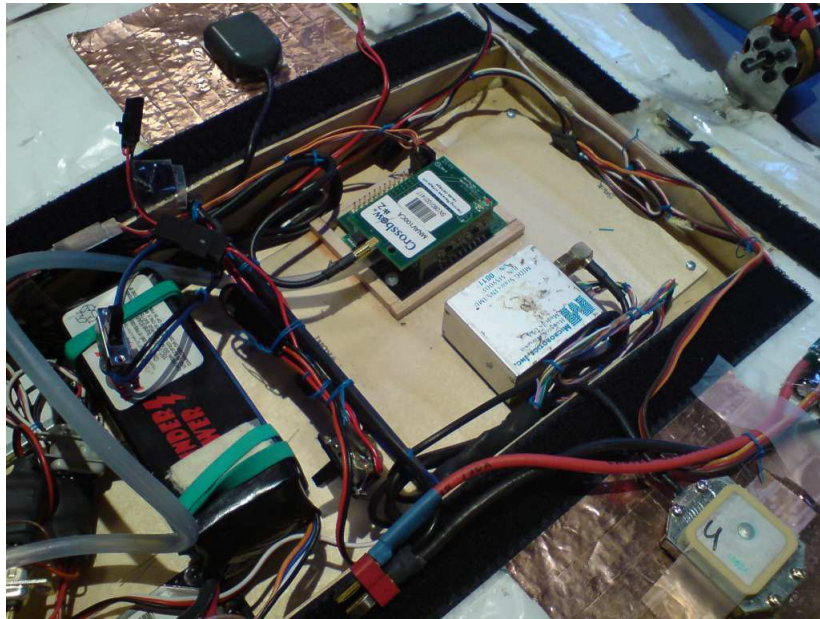


Figure 1: Setup of MicroNav and MIDG II on Unicorn UAV

2 Data and result

The first 2 figures show the plots of the synchronized data collected for the angular rates (p, q, r) and acceleration (a_x, a_y, a_z). Both plots show very good matching of the data collected from both the sensor. Next, the AHRS algorithms was applied to the data collected from the Micronav to estimate the roll, pitch and yaw angles (ϕ, θ, ψ) and the result is plotted against the attitude solution given by the MIDG II INS sensor. The result is shown in the third figure.

