

**F-16 Capstone**  
**Sensor Noise Analysis**  
**4/25/2021**

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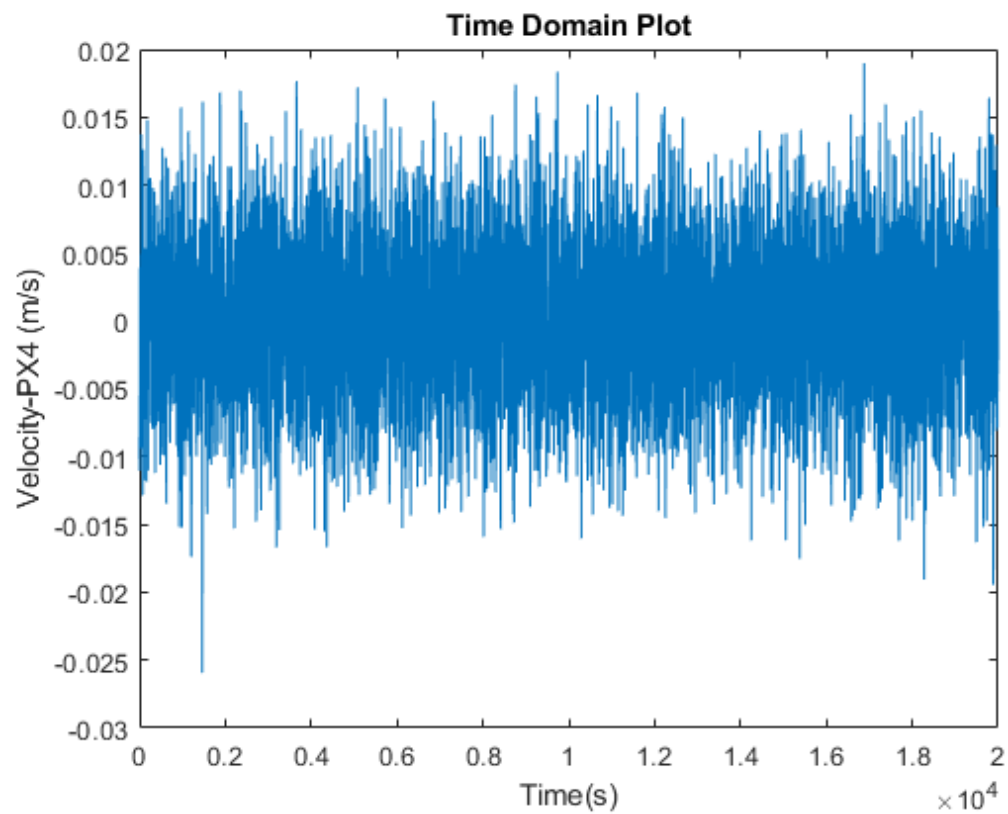
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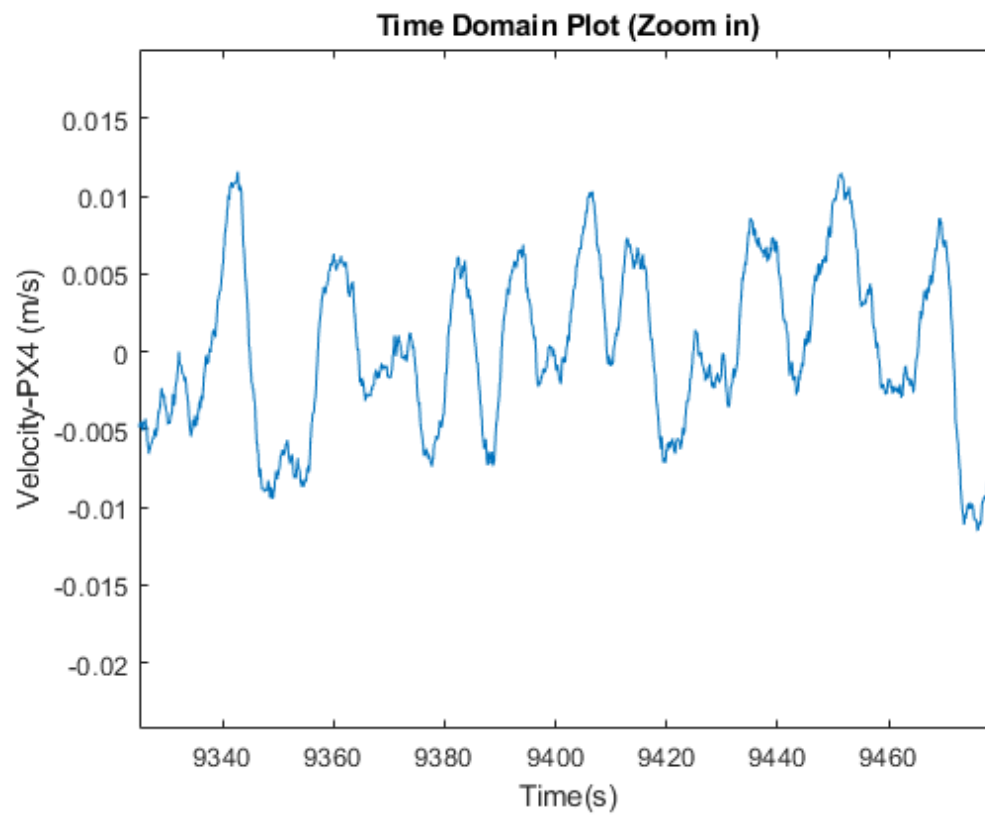
## 1. IMU in PX4

### 1.1 Velocity (PX4)

**Sample frequency: 10 Hz**

a. Time Domain Plot

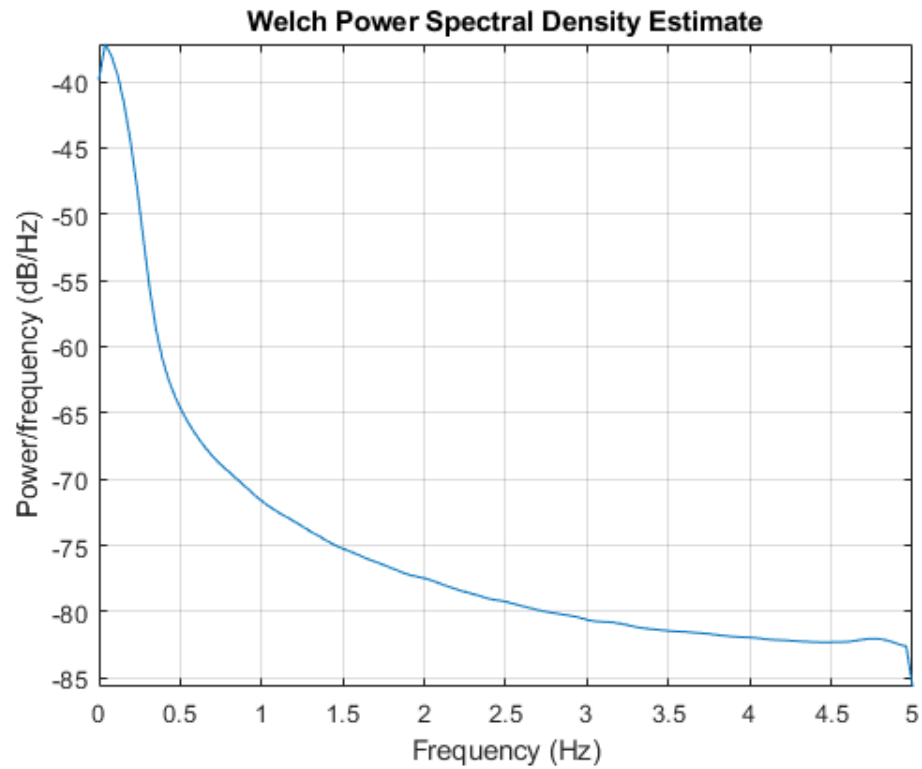




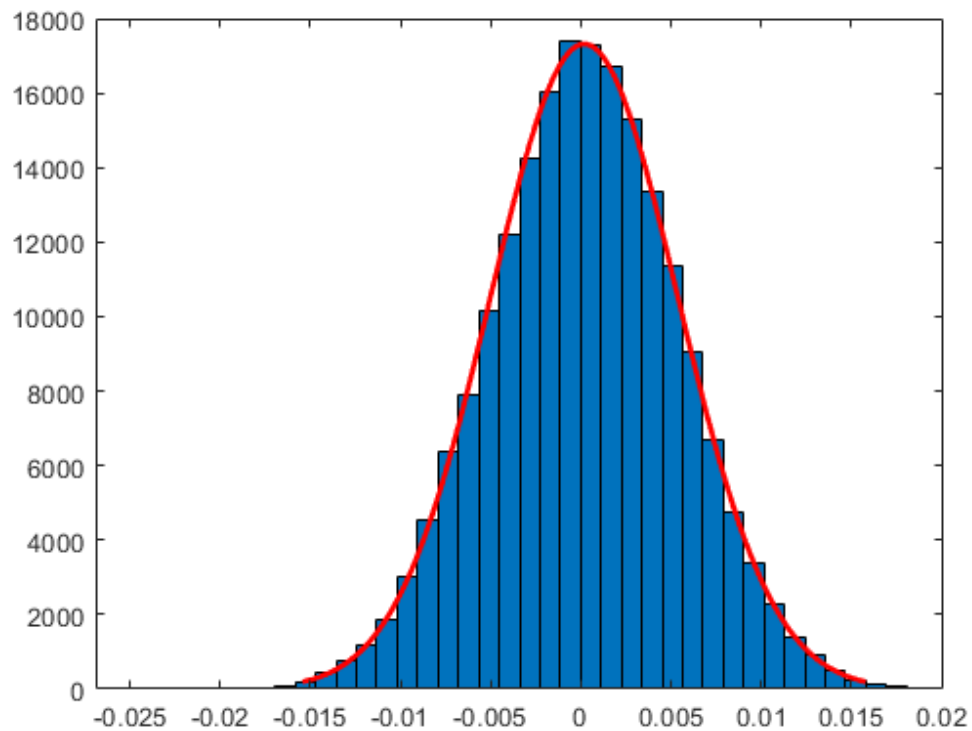
b. Mean Value and Standard Deviation

	Value
Mean Value	$-1.87 \times 10^{-4}$ m/s
Standard Deviation	0.0054 m/s

## c. Power Spectral Density Plot



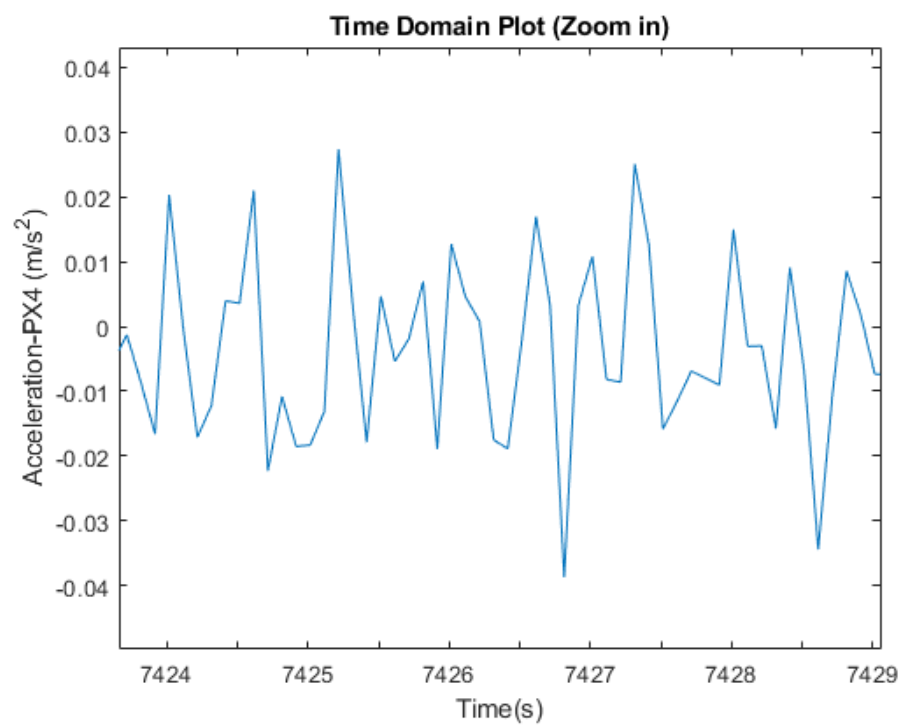
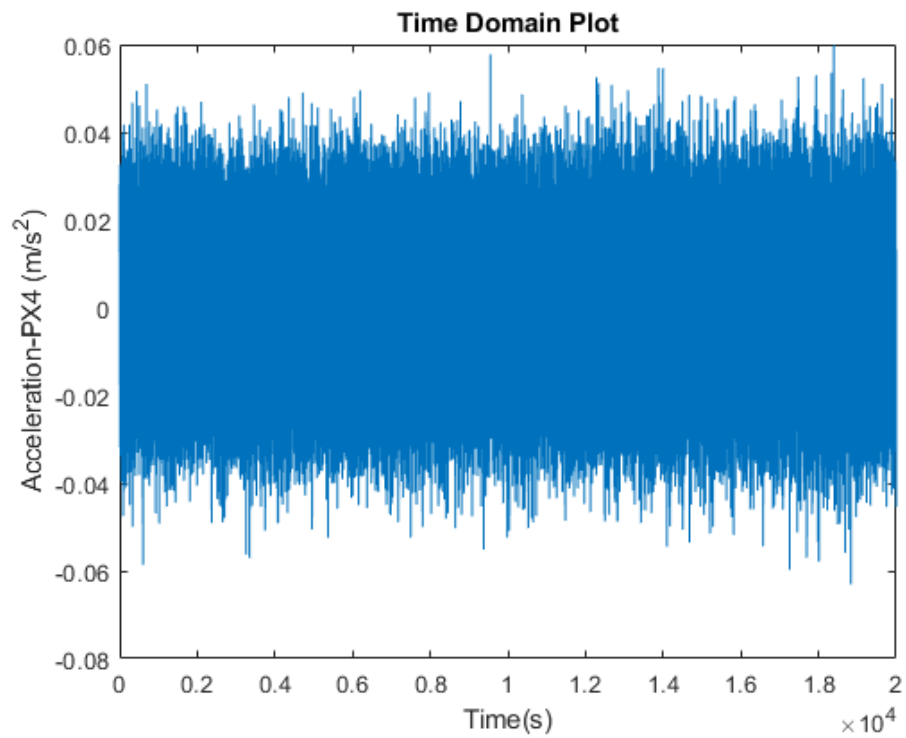
## d. Distribution Histogram



## 1.2 Acceleration (PX4)

**Sample frequency: 10 Hz**

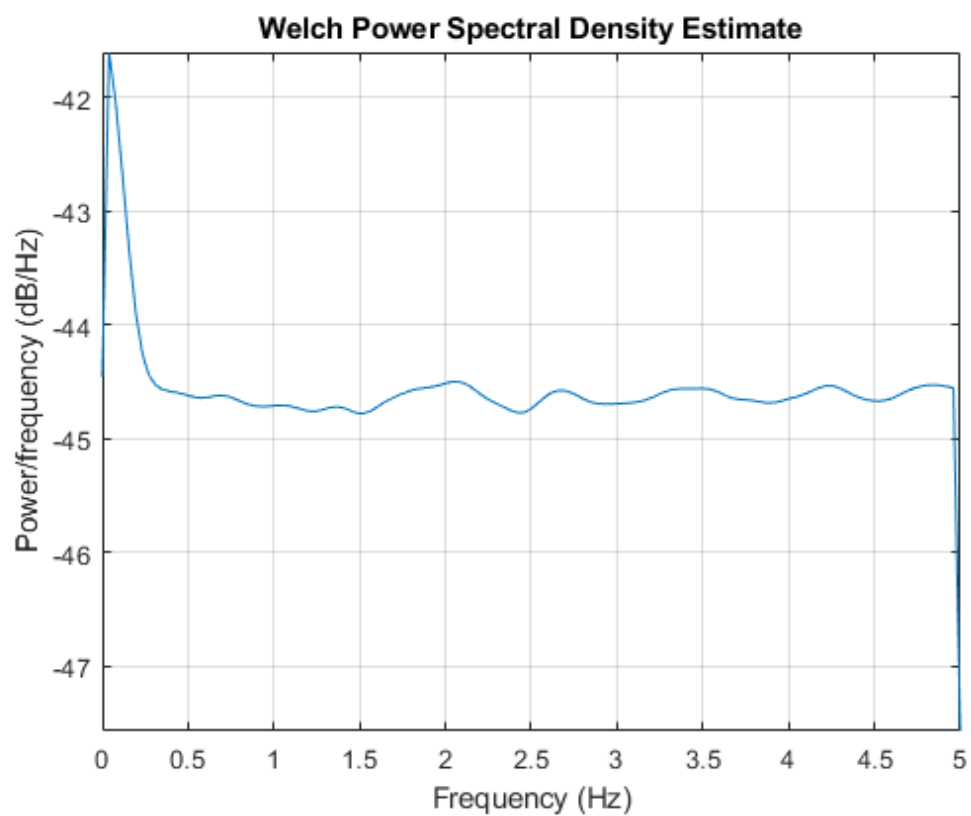
a. Time Domain Plot



## b. Mean Value and Standard Deviation

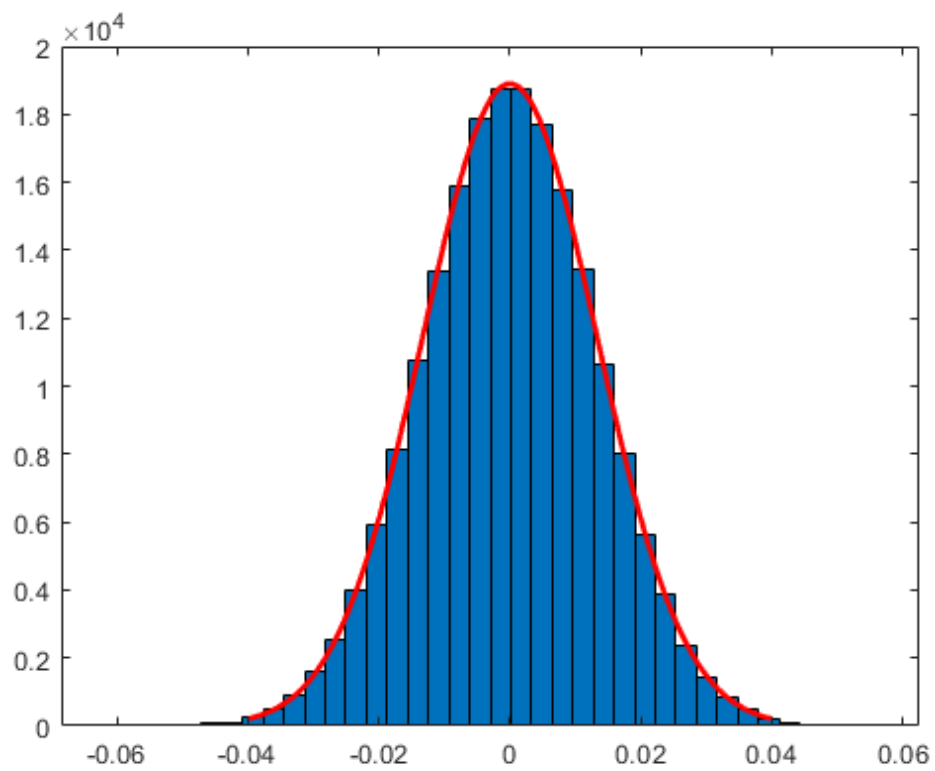
	Value
Mean Value	$-1.20 \times 10^{-6} \text{ m/s}^2$
Standard Deviation	$0.0133 \text{ m/s}^2$

## c. Power Spectral Density Plot





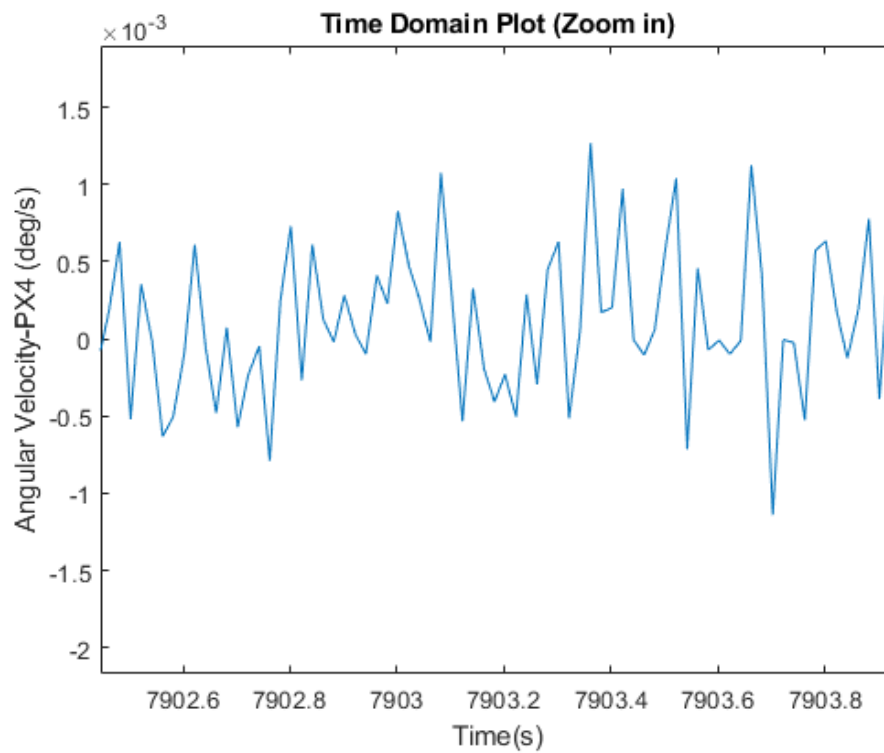
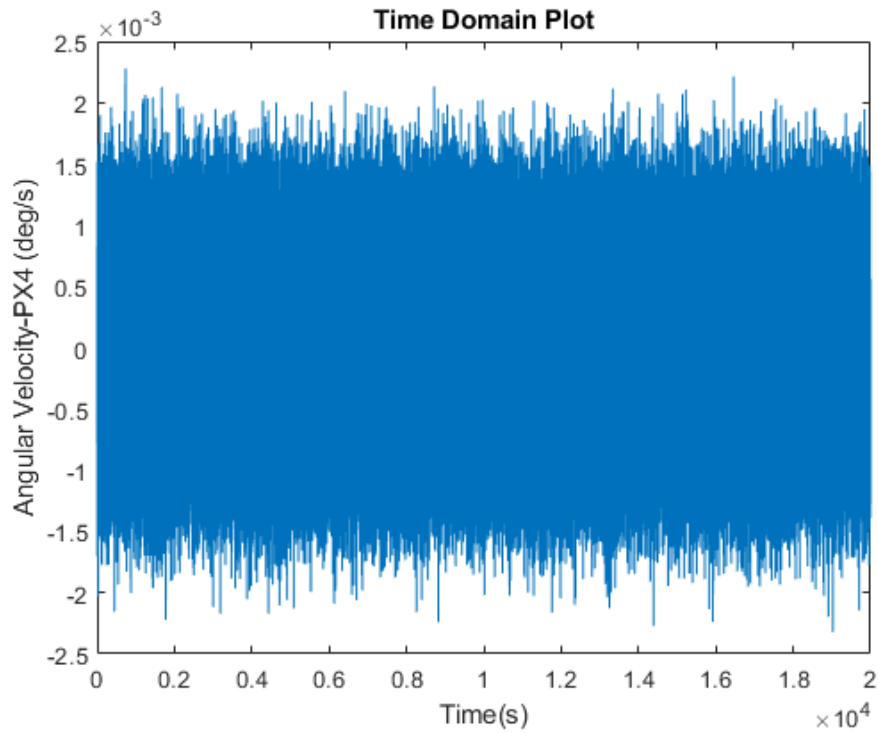
## d. Distribution Histogram



### 1.3 Angular Velocity (PX4)

**Sample frequency: 50 Hz**

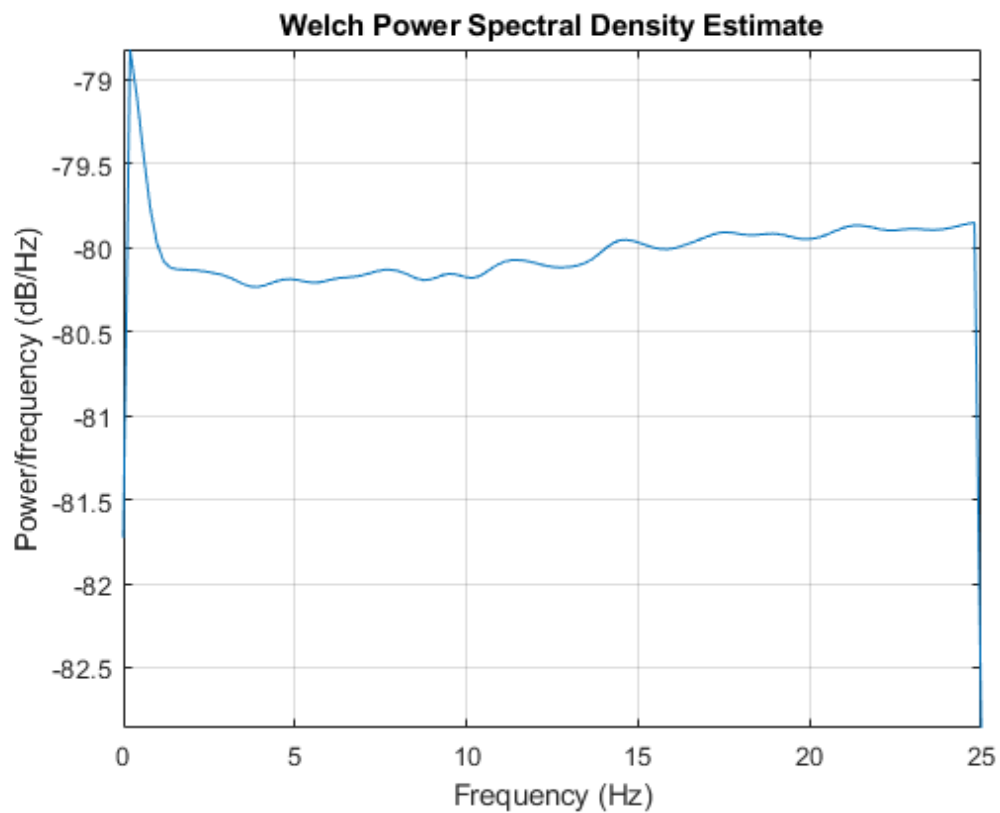
a. Time Domain Plot



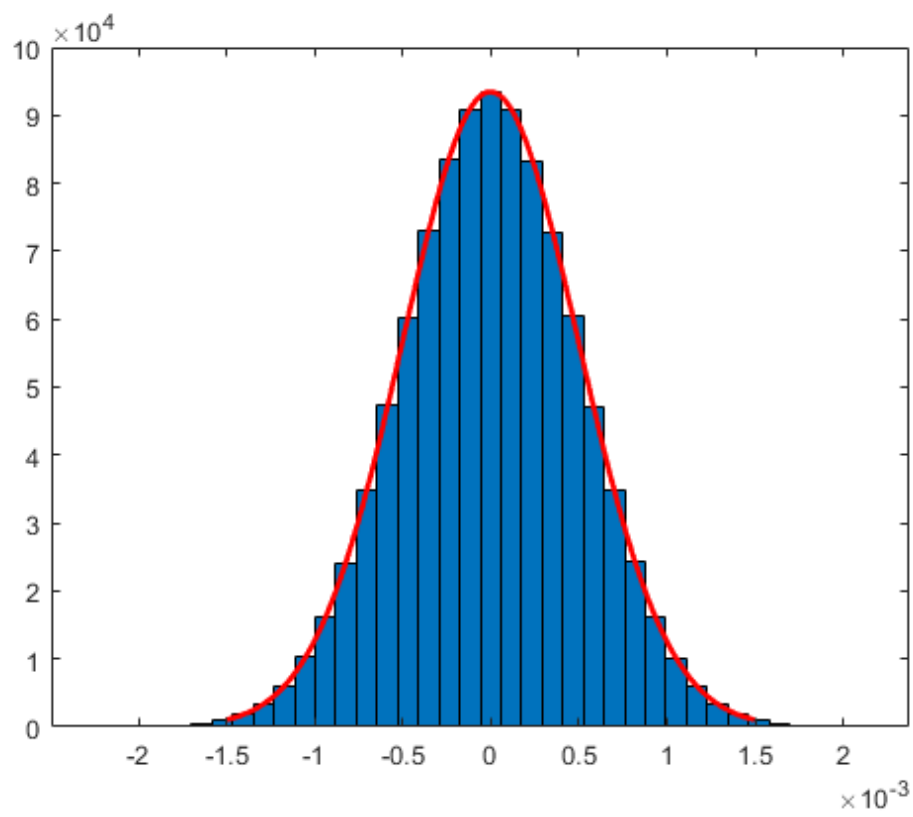
## b. Mean Value and Standard Deviation

	Value
Mean Value	$-1.74 \times 10^{-6}$ deg/s
Standard Deviation	$4.99 \times 10^{-4}$ deg/s

## c. Power Spectral Density Plot



## d. Distribution Histogram

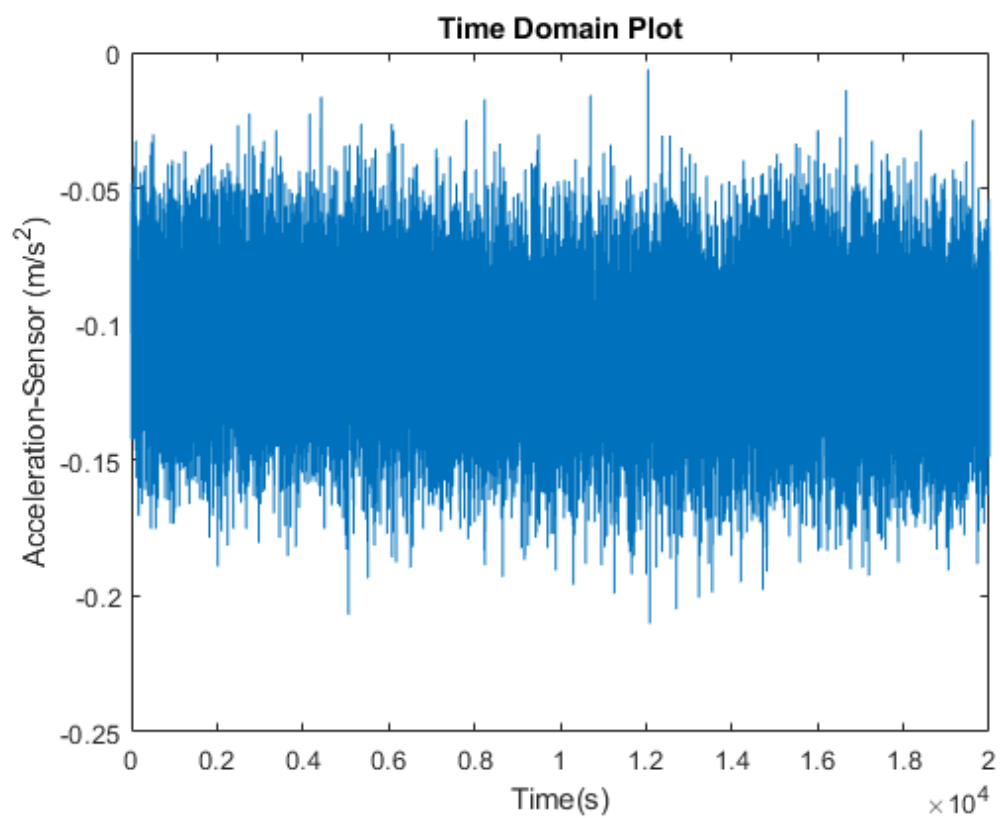


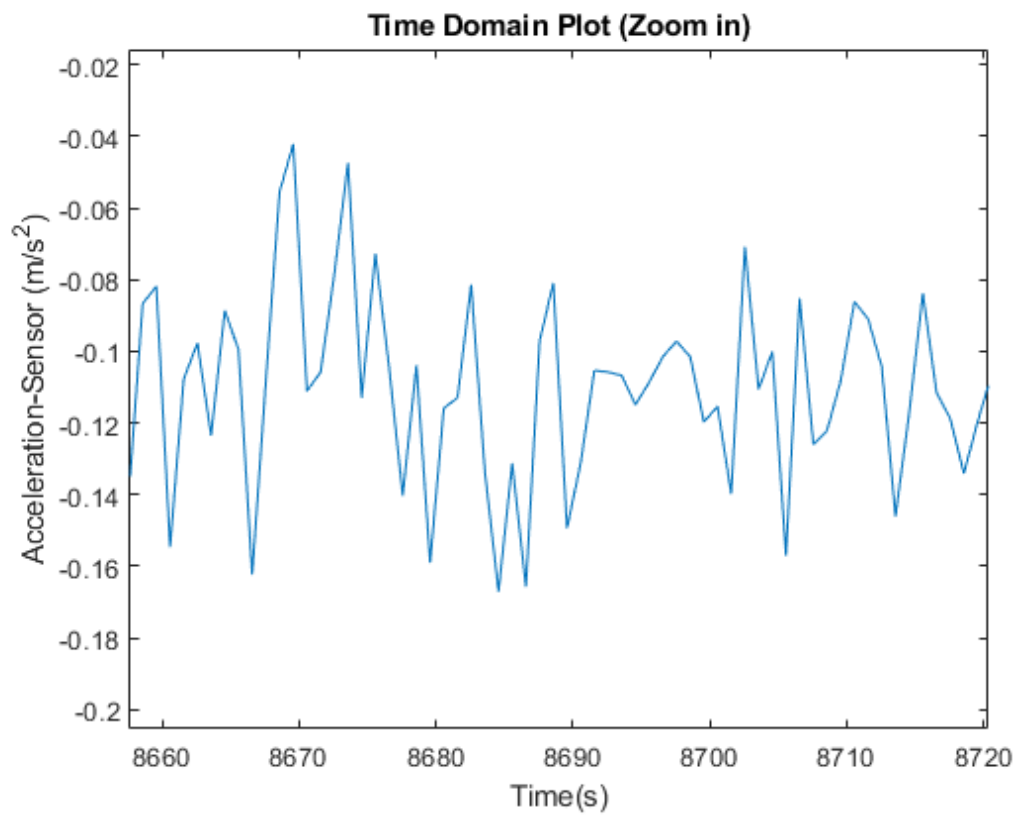
## 2. IMU Sensor

### 2.1 Acceleration (Sensor)

Sample frequency: 1 Hz

#### a. Time Domain Plot

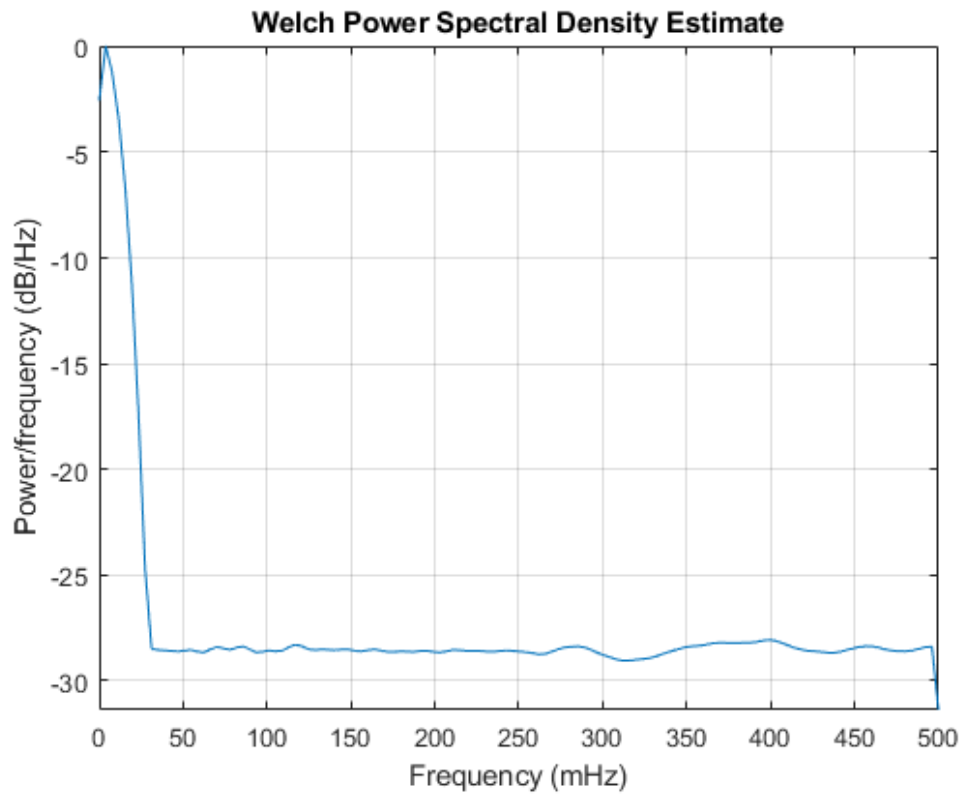




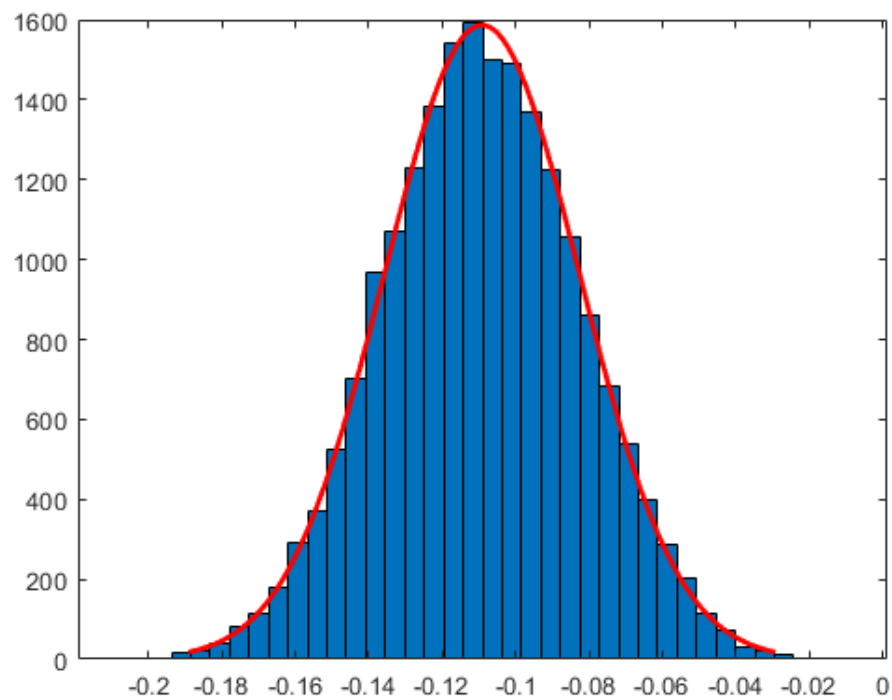
b. Mean Value and Standard Deviation

	Value
Mean Value	-0.109 m/s <sup>2</sup>
Standard Deviation	0.0266 m/s <sup>2</sup>

## c. Power Spectral Density Plot



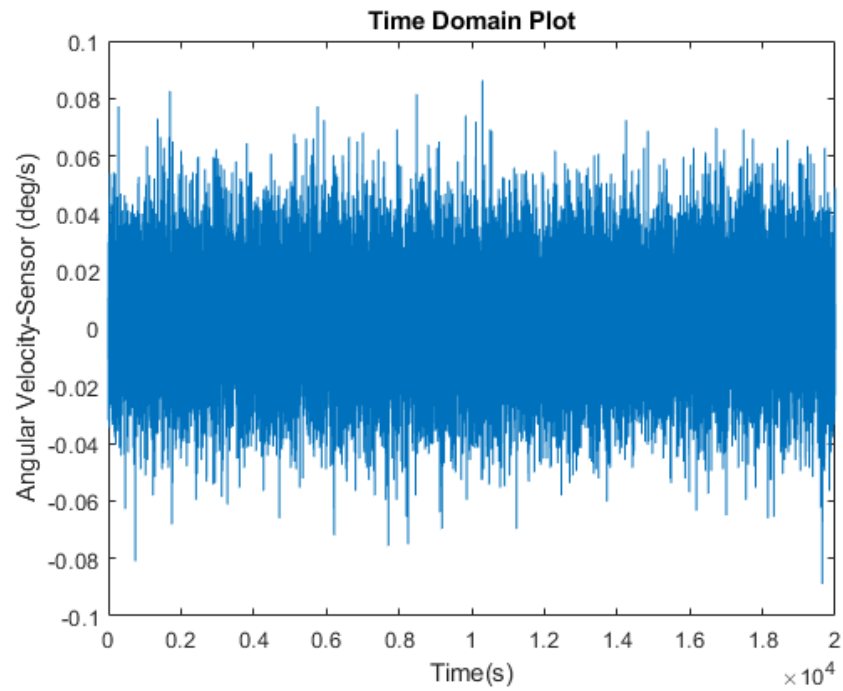
## d. Distribution Histogram



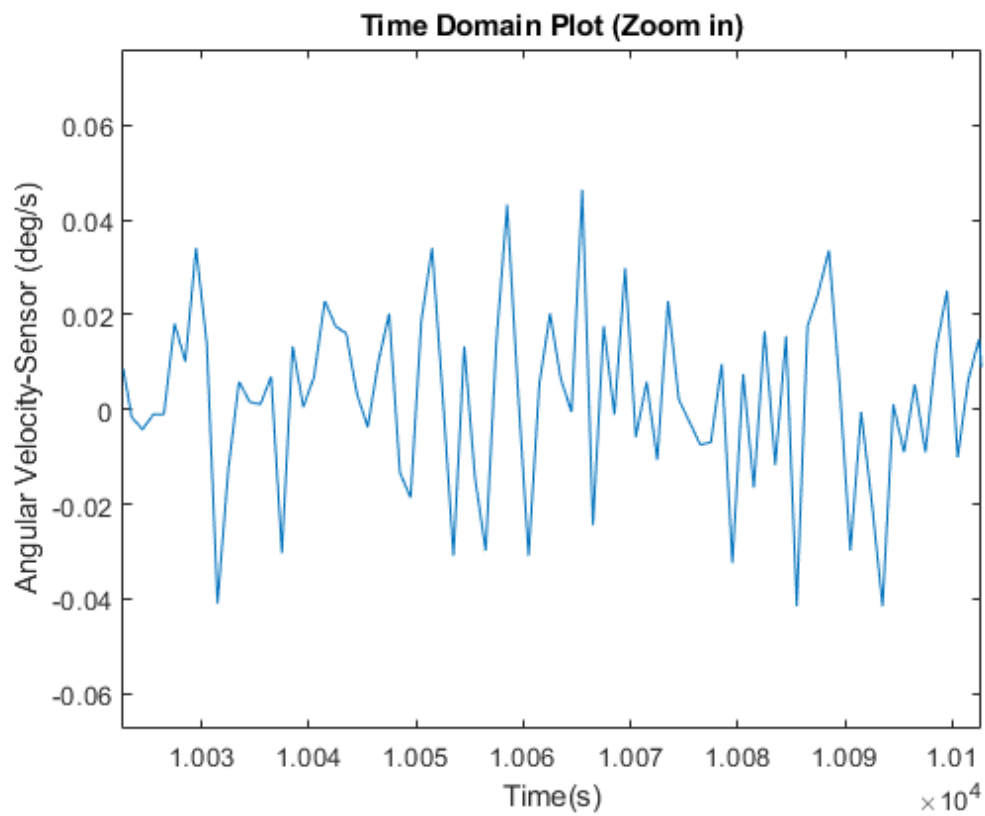
## 2.2 Angular Velocity (Sensor)

Sample frequency: 1 Hz

### a. Time Domain Plot



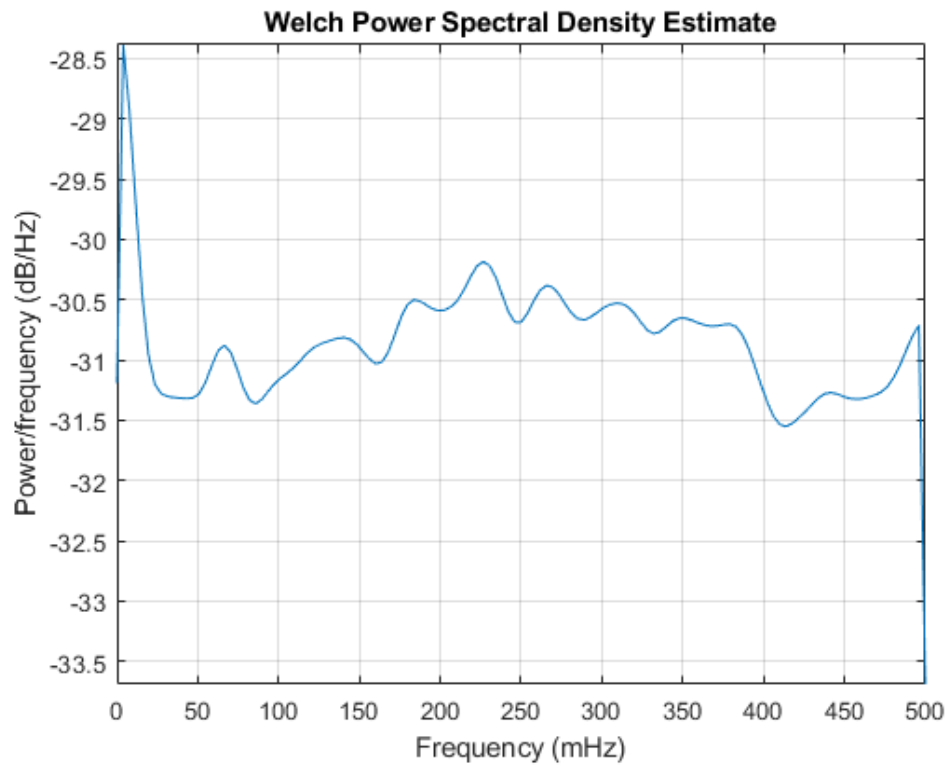




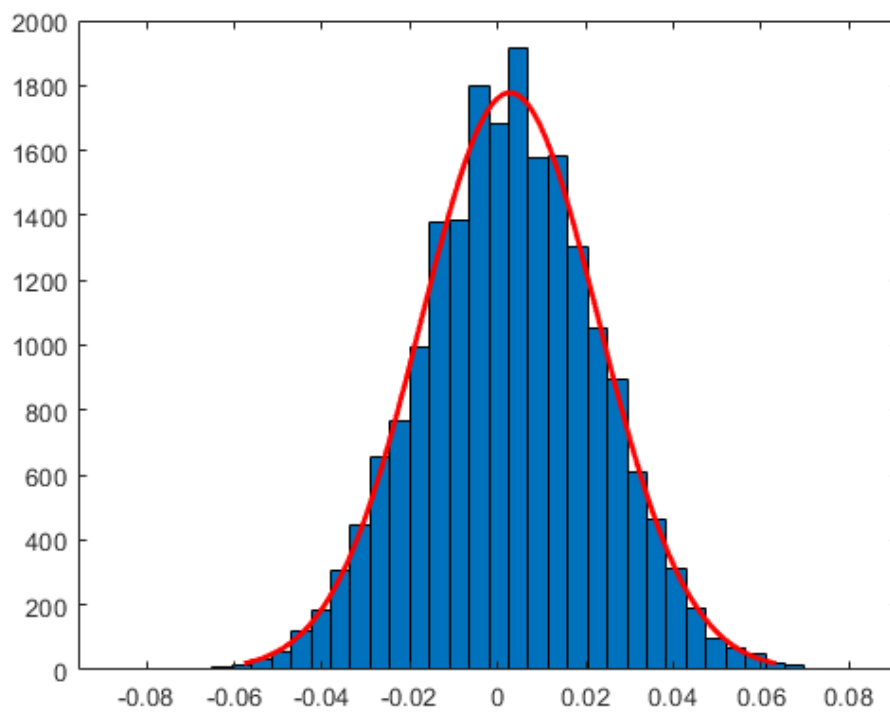
b. Mean Value and Standard Deviation

	Value
Mean Value	0.0028 deg/s
Standard Deviation	0.0202 deg/s

## c. Power Spectral Density Plot



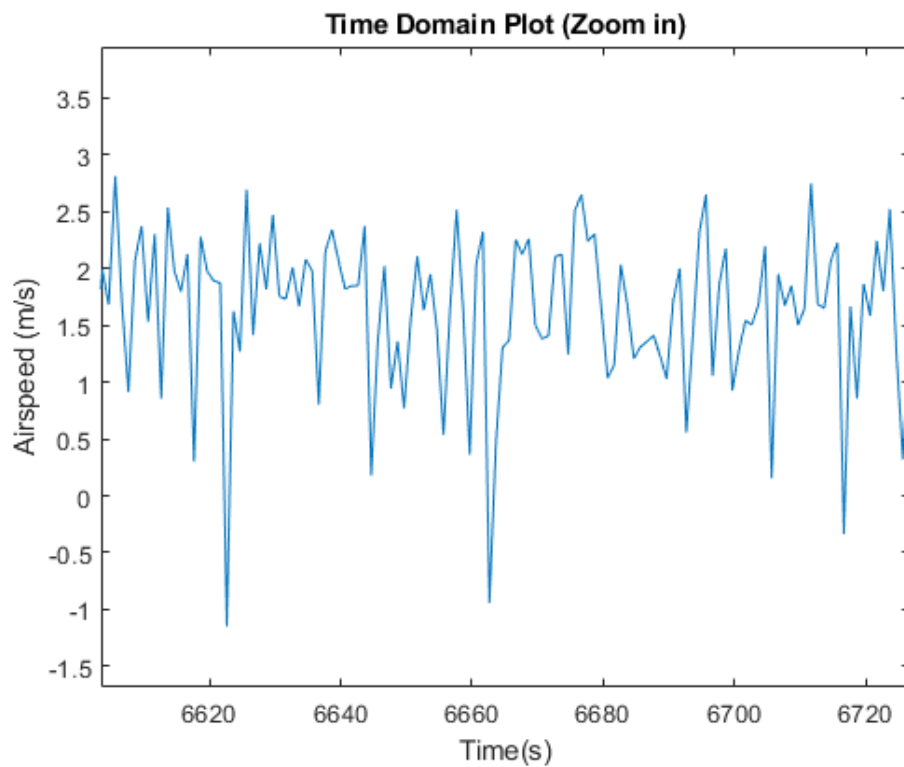
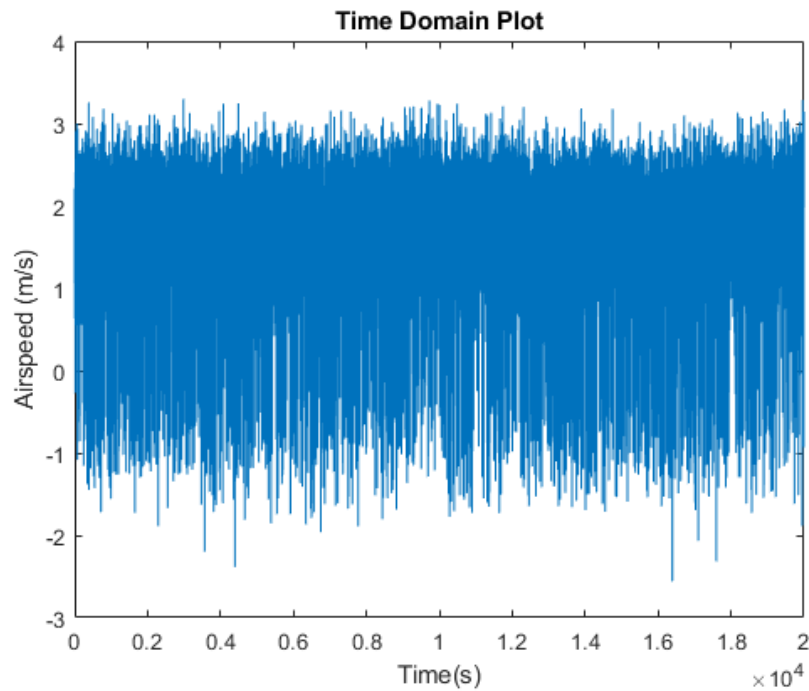
## d. Distribution Histogram



### 3. Airspeed

Sample frequency: 1 Hz

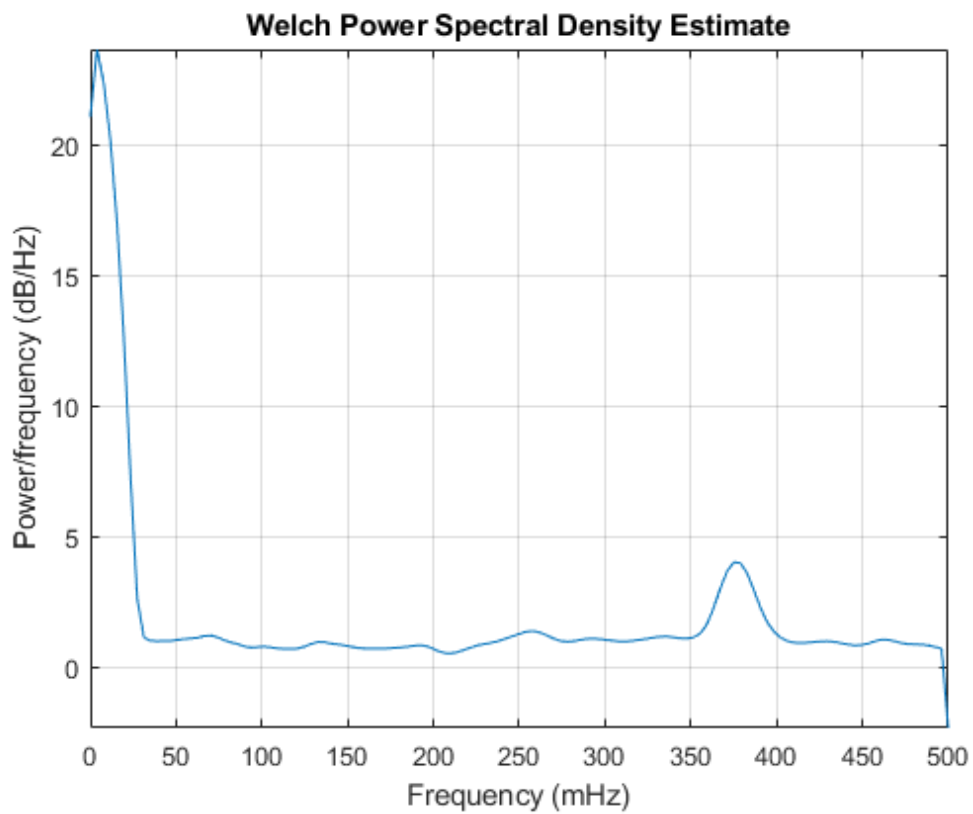
a. Time Domain Plot



## b. Mean Value and Standard Deviation

	Value
Mean Value	1.657 m/s
Standard Deviation	0.811 m/s

## c. Power Spectral Density Plot



## d. Distribution Histogram

