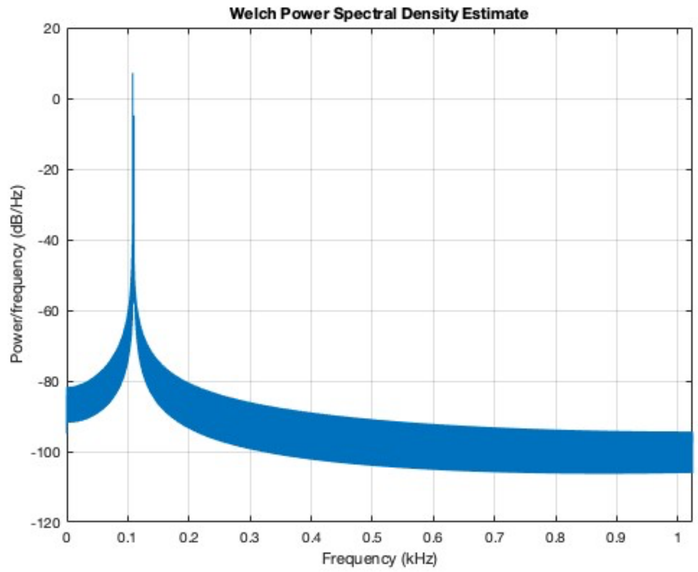
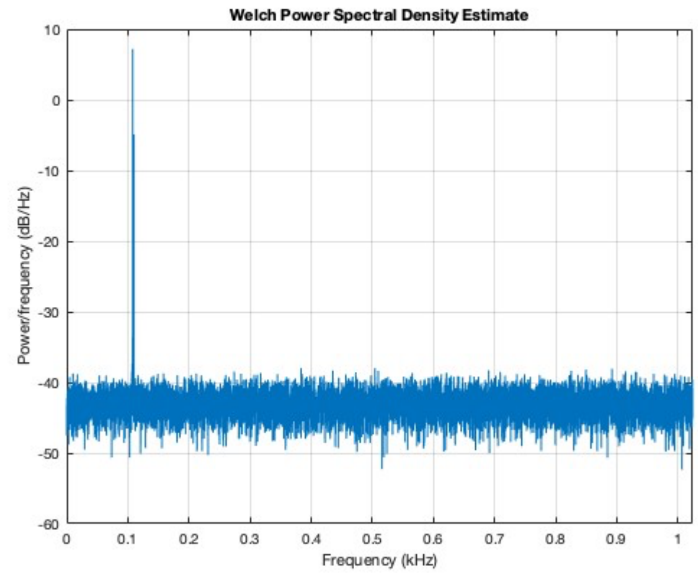
FIGURE 1



This image displays a Welch Power Spectral Density (PSD) estimate, a common technique for estimating the power of a signal as a function of frequency. The x-axis represents frequency in kilohertz (kHz), ranging from 0 to approximately 1 kHz, while the y-axis represents the power per frequency in decibels per hertz (dB/Hz). The plot clearly shows a prominent peak around 0.12 kHz, indicating a strong concentration of signal power at this specific frequency. This sharp peak suggests the presence of a dominant sinusoidal or periodic component within the analyzed signal. Beyond this peak, the power spectral density rapidly decreases and then remains at a significantly lower level across the remaining frequency range, exhibiting a broad, relatively flat noise floor. This overall shape is characteristic of a signal dominated by a fundamental frequency component, with less significant contributions from other frequencies or broadband noise.

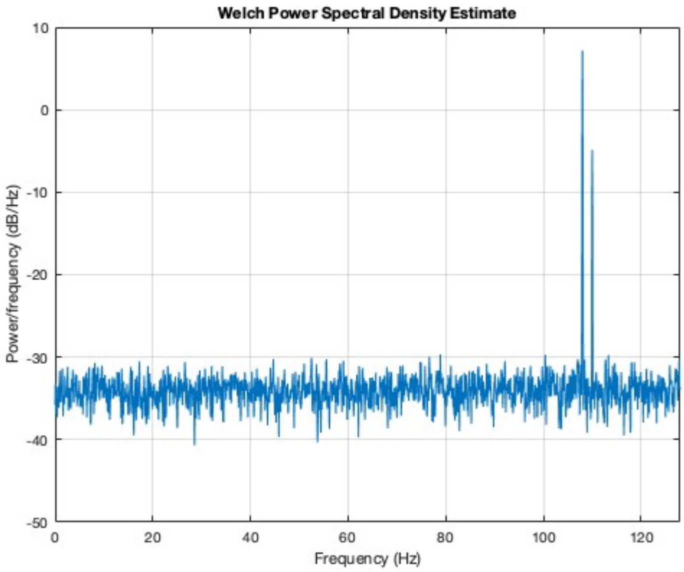
FIGURE 2



This image also presents a Welch Power Spectral Density (PSD) estimate, similar to the previous one, but with distinct differences in its characteristics.

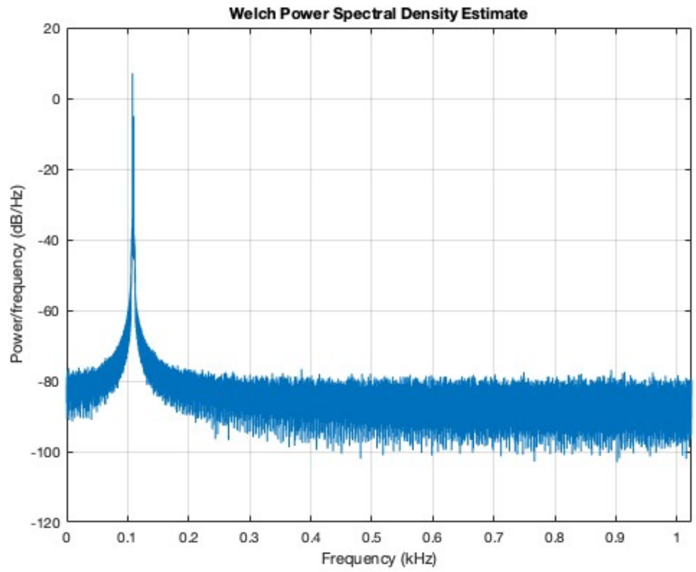
The x-axis represents frequency in kilohertz (kHz), ranging from 0 to approximately 1 kHz, and the y-axis displays power per frequency in decibels per hertz (dB/Hz). A very sharp and prominent peak is observed around 0.12 kHz, reaching approximately 8 dB/Hz. This indicates a strong, dominant frequency component at that specific point. Unlike the previous plot, the "noise floor" after the peak is significantly higher and more erratic, fluctuating roughly between -40 dB/Hz and -50 dB/Hz, with a more pronounced ripple. This suggests the presence of more significant broadband noise or other stochastic components distributed across the frequency spectrum, or potentially a lower signal-to-noise ratio compared to the signal represented in the prior image. The narrowness and height of the main peak still point to a clear, discrete frequency present in the signal, but it exists within a comparatively noisier environment.

FIGURE 3



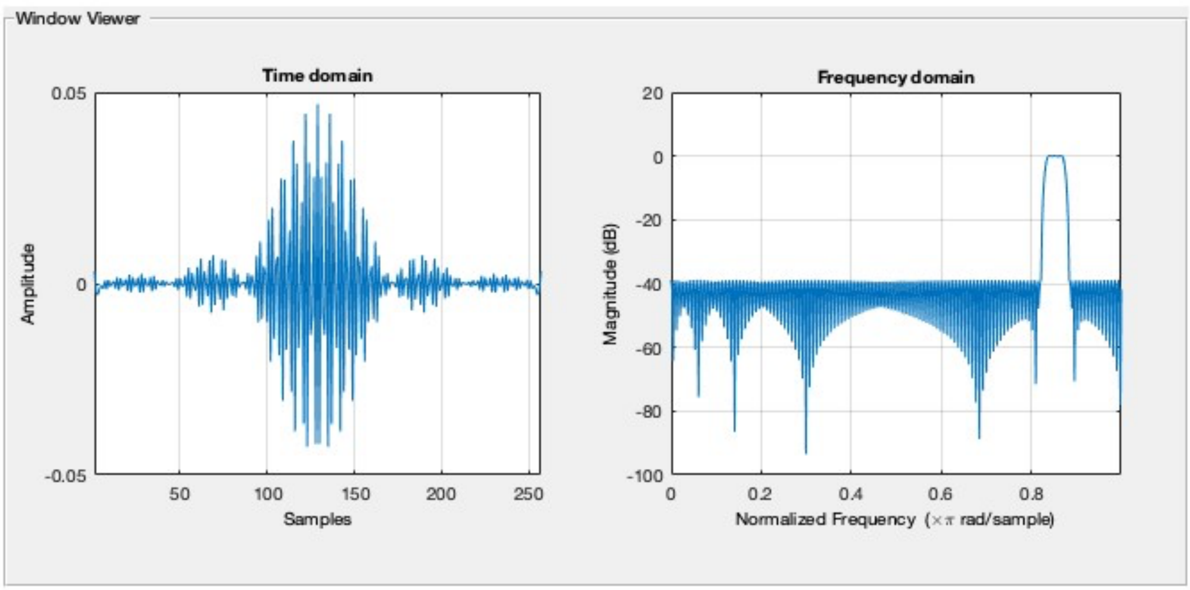
This image presents a Welch Power Spectral Density (PSD) estimate, similar to the previous examples, but with a different frequency range and spectral characteristics. The x-axis represents frequency in Hertz (Hz), spanning from 0 to approximately 120 Hz, while the y-axis shows power per frequency in decibels per hertz (dB/Hz). In contrast to the previous plots which had a single dominant peak, this PSD estimate displays two distinct, sharp peaks. The most prominent peak is observed just below 110 Hz, reaching nearly 8 dB/Hz, with a secondary peak appearing slightly lower in frequency, around 107-108 Hz, at approximately -4 dB/Hz. The presence of two such discrete peaks suggests that the analyzed signal contains at least two strong, distinct sinusoidal or periodic components at these specific frequencies. The "noise floor" across the rest of the spectrum is relatively consistent, fluctuating around -30 dB/Hz to -40 dB/Hz, indicating a background of broadband noise or other less dominant frequency components. The clear separation and sharpness of the peaks against this noise floor point to the presence of multiple, well-defined frequency components within the signal.

FIGURE 4



This image displays a Welch Power Spectral Density (PSD) estimate, a fundamental tool in signal processing for analyzing the frequency content of a signal. The horizontal axis represents frequency in kilohertz (kHz), spanning from 0 to 1 kHz, while the vertical axis indicates power per frequency in decibels per hertz (dB/Hz). The plot is characterized by a very sharp and prominent peak occurring around 0.12 kHz (or 120 Hz), reaching a power level close to 5 dB/Hz. This distinct peak signifies the presence of a strong, dominant periodic component at this particular frequency within the analyzed signal. Following this sharp peak, the power spectral density drops significantly and then levels off to a relatively low and somewhat noisy floor, fluctuating roughly between -80 dB/Hz and -100 dB/Hz across the rest of the displayed frequency range. The overall shape suggests a signal primarily composed of a strong fundamental frequency, with the remaining power distributed as a broadband noise floor. This type of PSD is typical for signals where a clear sinusoidal component is present, embedded in a background of lower-power, wideband noise.

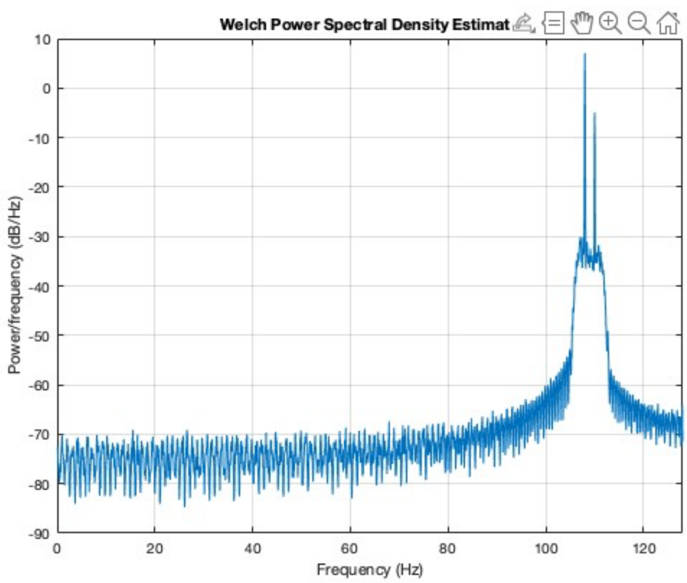
FIGURE 5



The left plot, labeled "Time domain," shows the signal's amplitude as a function of discrete samples. The signal appears as a modulated waveform, with its amplitude gradually increasing, peaking around sample 125, and then gradually decreasing, resembling an attenuated burst or a windowed sinusoidal signal. The oscillations within the envelope are rapid, indicating a relatively high-frequency component. The amplitude ranges approximately from -0.05 to 0.05.

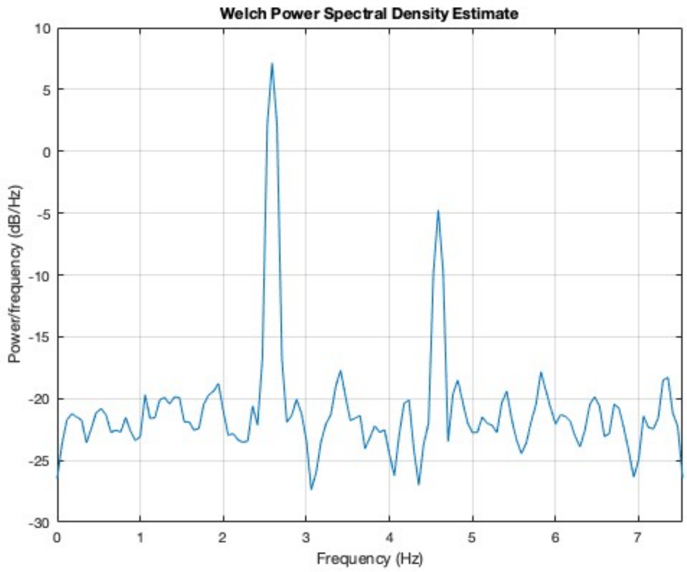
The right plot, labeled "Frequency domain," shows the magnitude (in dB) of the signal as a function of normalized frequency, ranging from 0 to 1 (corresponding to 0 to π radians/sample). This plot reveals the spectral content of the signal. It exhibits a clear bandpass characteristic, with a distinct passband visible between approximately 0.8 and 0.9 normalized frequency. Within this passband, the magnitude is relatively high (around 0 dB), indicating the presence of significant energy in this frequency range. Outside this passband, the magnitude drops sharply, forming deep notches and exhibiting a fluctuating pattern down to about -80 dB or lower, characteristic of filter stopbands or spectral shaping. The sharp transitions and flat top in the passband suggest that the signal has been either generated by or passed through a bandpass filter.

FIGURE 6



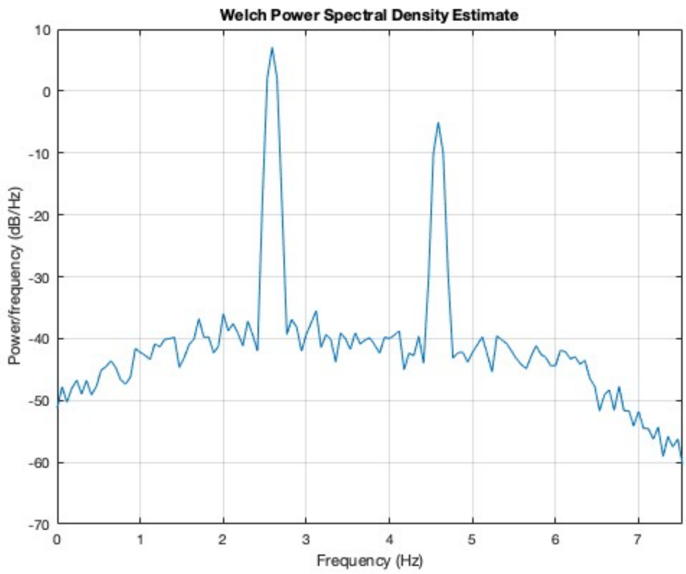
This image presents a Welch Power Spectral Density (PSD) estimate, a widely used method for analyzing the frequency content of a signal. The x-axis represents frequency in Hertz (Hz), ranging from 0 to approximately 120 Hz, while the y-axis indicates power per frequency in decibels per hertz (dB/Hz). The plot exhibits a clear and prominent feature: a dominant spectral component centered around 108-110 Hz. This feature is not a single, sharp peak but rather appears as a main peak at approximately 8 dB/Hz, accompanied by a slightly lower, adjacent peak or shoulder just below it, creating a broadened, somewhat complex spectral feature. This morphology suggests the presence of either two closely spaced sinusoidal components or a single, modulated component with sidebands. Below this main spectral feature, the power spectral density drops significantly, forming a "noise floor" that fluctuates around -60 dB/Hz to -70 dB/Hz across the lower frequency range. The overall shape indicates a signal that primarily consists of energy concentrated within a narrow band of higher frequencies, with the rest of the spectrum dominated by lower-level broadband noise. The distinctness of the peak(s) against the noise floor highlights the strong presence of these particular frequency components in the signal.

FIGURE 7



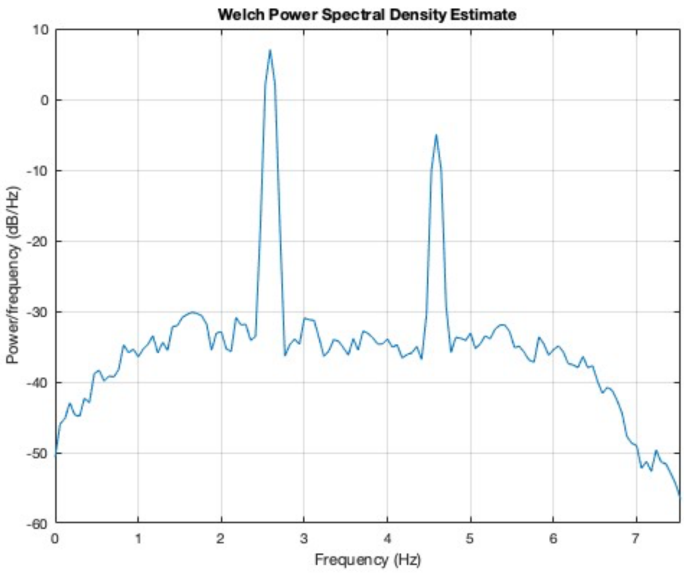
This image displays a Welch Power Spectral Density (PSD) estimate, illustrating the distribution of signal power across different frequencies. The horizontal axis represents frequency in Hertz (Hz), ranging from 0 to approximately 7.5 Hz. The vertical axis shows power per frequency in decibels per hertz (dB/Hz). The plot clearly reveals two distinct and prominent peaks, indicating the presence of two strong, discrete frequency components within the analyzed signal. The first and most dominant peak is located around 2.5 Hz, reaching a power level of approximately 7 dB/Hz. The second peak, smaller in magnitude, is observed around 4.5 Hz, with a power level of about -5 dB/Hz. Between and around these peaks, the power spectral density is significantly lower, fluctuating between approximately -20 dB/Hz and -25 dB/Hz. This lower, fluctuating level represents the noise floor or the power contribution from other less dominant, broadband frequency components. The clear separation and sharpness of the two peaks against this background suggest that the signal is primarily composed of these two fundamental frequencies. This type of PSD is typical for signals containing multiple sinusoidal components.

FIGURE 8



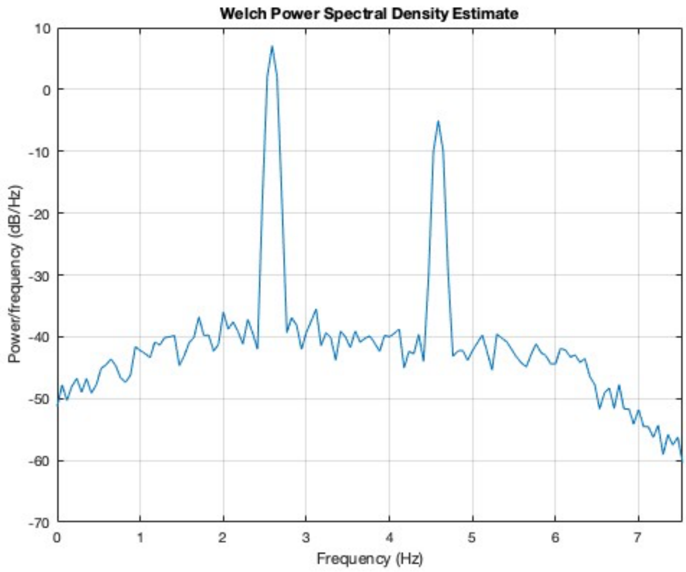
This image displays a Welch Power Spectral Density (PSD) estimate, a standard method for visualizing the frequency content of a signal. The x-axis represents frequency in Hertz (Hz), ranging from 0 to approximately 7.5 Hz. The y-axis denotes power per frequency in decibels per hertz (dB/Hz). The plot clearly shows two distinct and well-defined peaks, indicating the presence of two dominant frequency components in the signal. The first and most prominent peak occurs around 2.5 Hz, reaching a power level of approximately 7 dB/Hz. The second peak, smaller in amplitude, is located around 4.5 Hz, with a power level of about -7 dB/Hz. Between and outside these primary peaks, the power spectral density is significantly lower, forming a discernible "noise floor." This floor is not entirely flat but shows some fluctuations, generally lying between -30 dB/Hz and -50 dB/Hz. The distinctness and sharpness of these two peaks against the relatively lower and somewhat noisy background suggest that the signal is primarily composed of these two fundamental frequency components, with other frequencies contributing to the overall noise. This is characteristic of a signal that contains multiple pure tones or narrow-band signals embedded in noise.

FIGURE 9



This image presents a Welch Power Spectral Density (PSD) estimate, a method for visualizing the distribution of a signal's power over its frequency range. The x-axis represents frequency in Hertz (Hz), spanning from 0 to approximately 7.5 Hz, while the y-axis shows power per frequency in decibels per hertz (dB/Hz). The plot clearly displays two prominent and distinct peaks, indicating the presence of two strong, specific frequency components within the analyzed signal. The first and most significant peak is located around 2.5 Hz, reaching a power level of approximately 7 dB/Hz. The second peak, smaller in magnitude, is observed around 4.5 Hz, with a power level of about -7 dB/Hz. Between these two primary peaks and extending across the lower and higher frequency ends, there is a discernible "noise floor" or background spectrum. This floor fluctuates, generally lying between -30 dB/Hz and -50 dB/Hz, and appears to rise slightly towards lower frequencies before decreasing again at the far ends of the spectrum. The sharpness and height of the two main peaks, clearly standing out against this lower-power background, strongly suggest that the signal under analysis is composed primarily of these two distinct sinusoidal or periodic components, with additional broadband noise or other less significant frequency content.

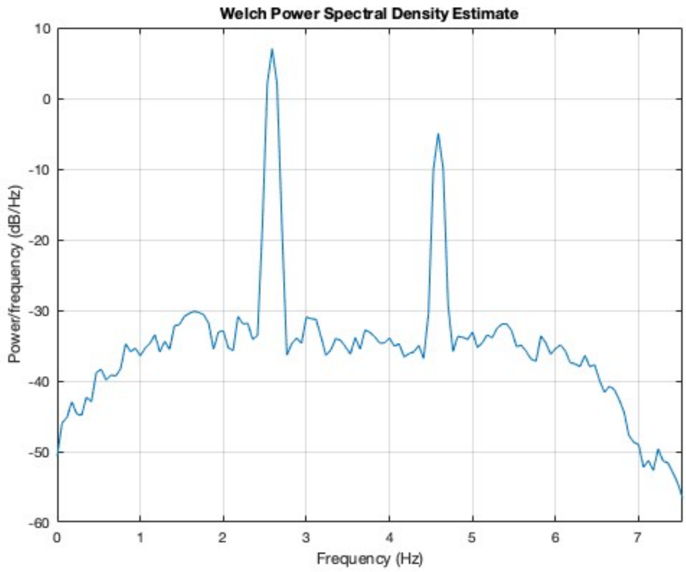
FIGURE 10



This image displays a Welch Power Spectral Density (PSD) estimate, a fundamental tool in signal processing for characterizing the frequency content of a signal. The horizontal axis represents frequency in Hertz (Hz), ranging from 0 to approximately 7.5 Hz, while the vertical axis indicates power per frequency in decibels per hertz (dB/Hz).

The plot distinctly shows two prominent peaks, which signify the presence of two strong, discrete frequency components within the analyzed signal. The first and more dominant peak is located around 2.5 Hz, reaching a power level of approximately 7 dB/Hz. The second peak, of a lower magnitude, is observed around 4.5 Hz, with a power level of about -7 dB/Hz. Beyond these two primary peaks, the power spectral density drops to a lower, fluctuating level, representing the "noise floor." This background spectrum is generally between -30 dB/Hz and -50 dB/Hz, showing some ripple and a gradual decrease towards the higher frequency end. The clear separation and sharpness of the two main peaks against this background suggest that the signal primarily consists of these two specific frequency components, with other frequencies contributing to the overall noise. This pattern is characteristic of a signal containing multiple distinct sinusoidal or periodic elements.

FIGURE 11



This image presents a Welch Power Spectral Density (PSD) estimate, a fundamental tool in signal processing for analyzing the frequency content of a signal. The horizontal axis represents frequency in Hertz (Hz), ranging from 0 to approximately 7.5 Hz, while the vertical axis indicates power per frequency in decibels per hertz (dB/Hz). The plot distinctly shows two prominent peaks, which signify the presence of two strong, discrete frequency components within the analyzed signal. The first and more dominant peak is located around 2.5 Hz, reaching a power level of approximately 7 dB/Hz. The second peak, of a lower magnitude, is observed around 4.5 Hz, with a power level of about -7 dB/Hz. Beyond these two primary peaks, the power spectral density drops to a lower, fluctuating level, representing the "noise floor." This background spectrum is generally between -30 dB/Hz and -50 dB/Hz, showing some ripple and a gradual decrease towards the higher frequency end. The clear separation and sharpness of the two main peaks against this background suggest that the signal primarily consists of these two specific frequency components, with other frequencies contributing to the overall noise. This pattern is characteristic of a signal containing multiple distinct sinusoidal or periodic elements.