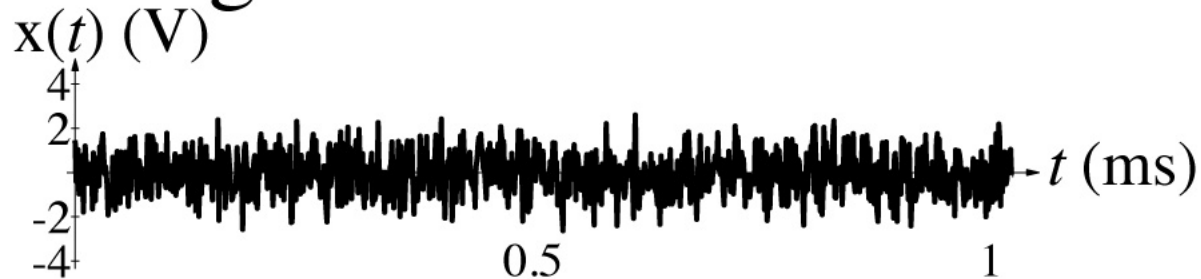


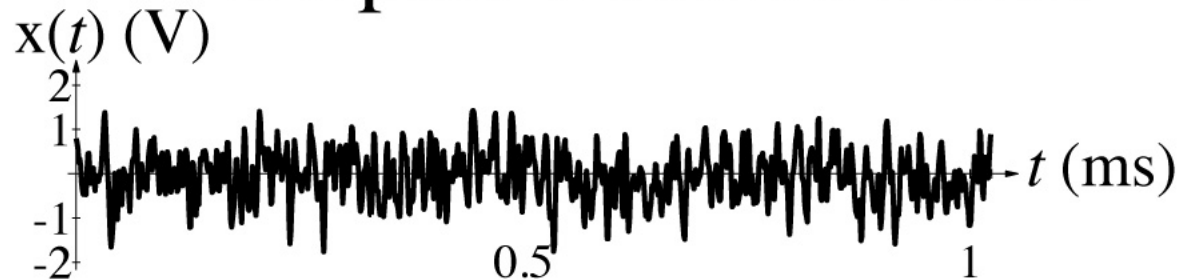
Some measurements are stochastic, meaning the signal is random and information resides in the variance of the signal. A common type of noise is "white noise" which has a flat CTFT. That is, its CTFT magnitude is the same at all frequencies. Sometimes the noise signal is filtered before finding its variance. This is sometimes done to avoid frequencies at which there might be an electromagnetic interference (EMI) signal. It is important in measurements of this type to be sure there is no EMI in the bandpass range of the filter that could cause the variance to be too large.

Look at the original wide-band noise signal and the filtered noise signal below. Is there any EMI present? EMI is characterized by being predictable instead of random like the noise signal. It certainly is not obvious in looking at these noise signals that EMI is present. They look random.

Original Wide-Band Noise

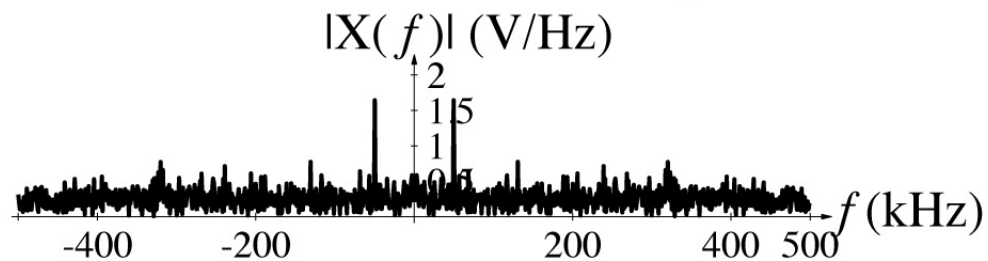


Lowpass-Filtered Noise



A very good way to detect EMI in noise signals is to examine the CTFT magnitude of the signal. Now it is obvious that there is a strong sinusoidal, or nearly sinusoidal, EMI signal at about 50 kHz.

CTFT Magnitude of Original Wide-Band Noise Signal



CTFT Magnitude of Lowpass-Filtered Noise

