
Windows

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Data

```
N = 51;
m = 0:N-1;

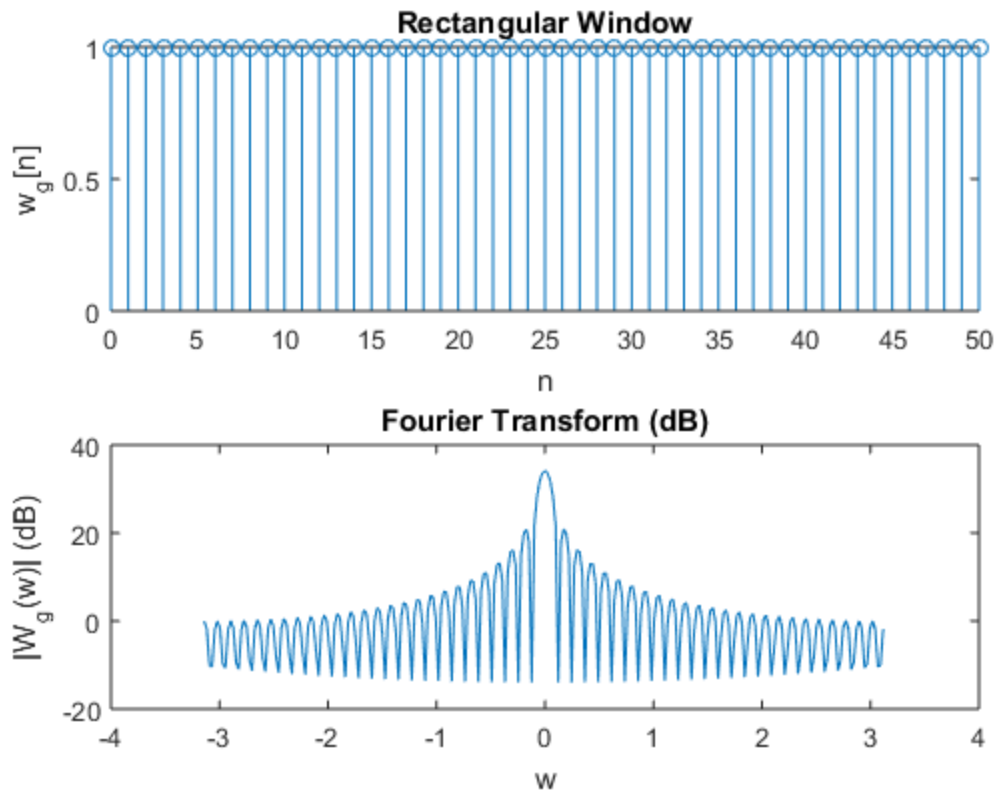
M = 256;
f = (-M/2:M/2-1)/M;
w = 2*pi*(-M/2:M/2-1)/M;
```

Rectangluar Window

```
w_g = zeros(1,N);
n = 0;
for k = 1:N
    if (n >= 0 && n <= (N-1))
        w_g(k) = 1;
    else
        w_g(k) = 0;
    end
    n = n + 1;
end

W_g = fftshift(fft(w_g,M));
W_g_dB = mag2db(abs(W_g));

figure,
subplot(211), stem(m,w_g), xlabel('n'), ylabel('w_g[n]'),
    title('Rectangular Window');
subplot(212), plot(w,W_g_dB), xlabel('w'), ylabel('|W_g(w)| (dB)'),
    title('Fourier Transform (dB)');
```



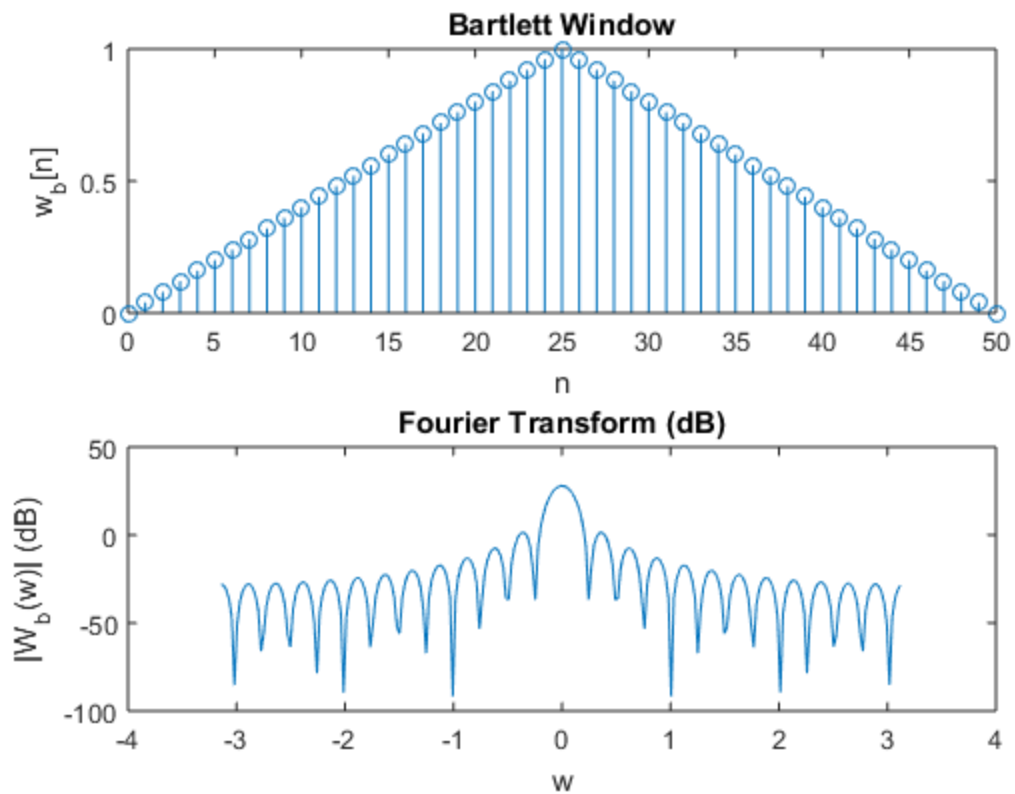
Bartlett Window

```

w_b = zeros(1,N);
n = 0;
for k = 1:N
    if (n >= 0 && n <= (N-1)/2)
        w_b(k) = 2*n/(N-1);
    elseif (n > (N-1)/2 && n <= (N-1))
        w_b(k) = 2 - 2*n/(N-1);
    else
        w_b(k) = 0;
    end
    n = n + 1;
end

W_b = fftshift(fft(w_b,M));
W_b_dB = mag2db(abs(W_b));

figure,
subplot(211), stem(m,w_b), xlabel('n'), ylabel('w_b[n]'),
    title('Bartlett Window');
subplot(212), plot(w,W_b_dB), xlabel('w'), ylabel('|W_b(w)| (dB)'),
    title('Fourier Transform (dB)');
```



Hanning Window

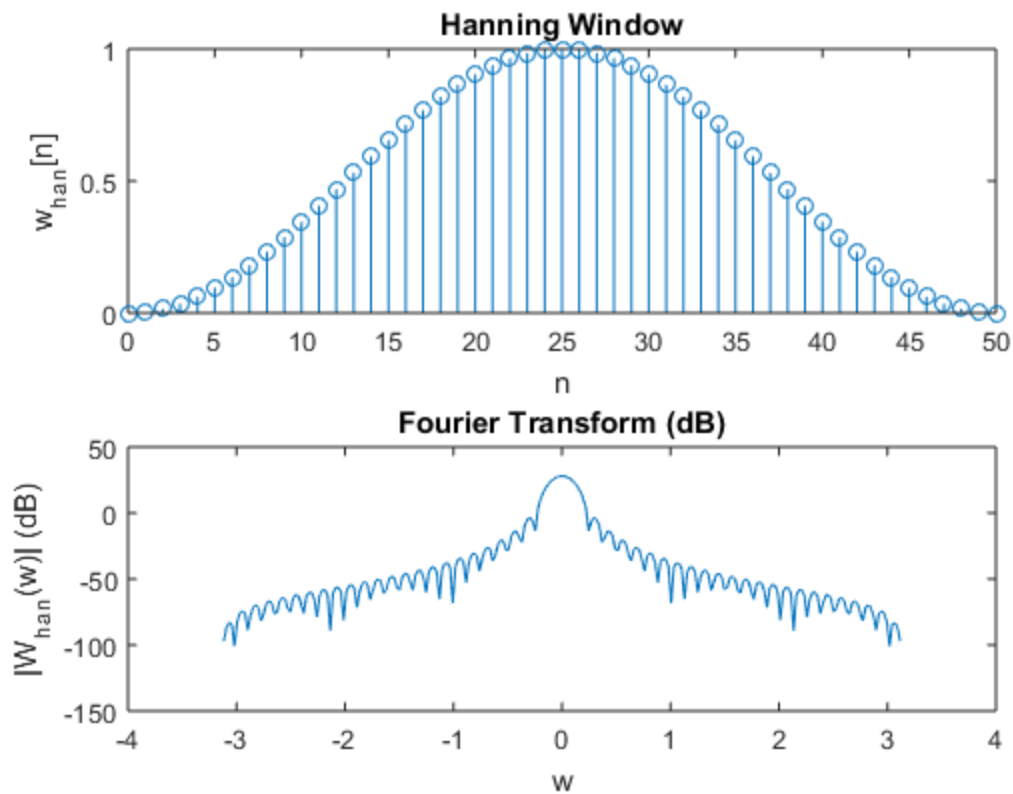
```

w_han = zeros(1,N);
n = 0;
for k = 1:N
    if (n >= 0 && n <= (N-1))
        w_han(k) = 0.5 - 0.5*cos(2*pi*n/(N-1));
    else
        w_han(k) = 0;
    end
    n = n + 1;
end

W_han = fftshift(fft(w_han,M));
W_han_dB = mag2db(abs(W_han));

figure,
subplot(211), stem(m,w_han), xlabel('n'), ylabel('w_h_a_n[n]'),
    title('Hanning Window');
subplot(212), plot(w,W_han_dB), xlabel('w'), ylabel('|W_h_a_n(w)|
    (dB)'), title('Fourier Transform (dB)');

```



Hamming Window

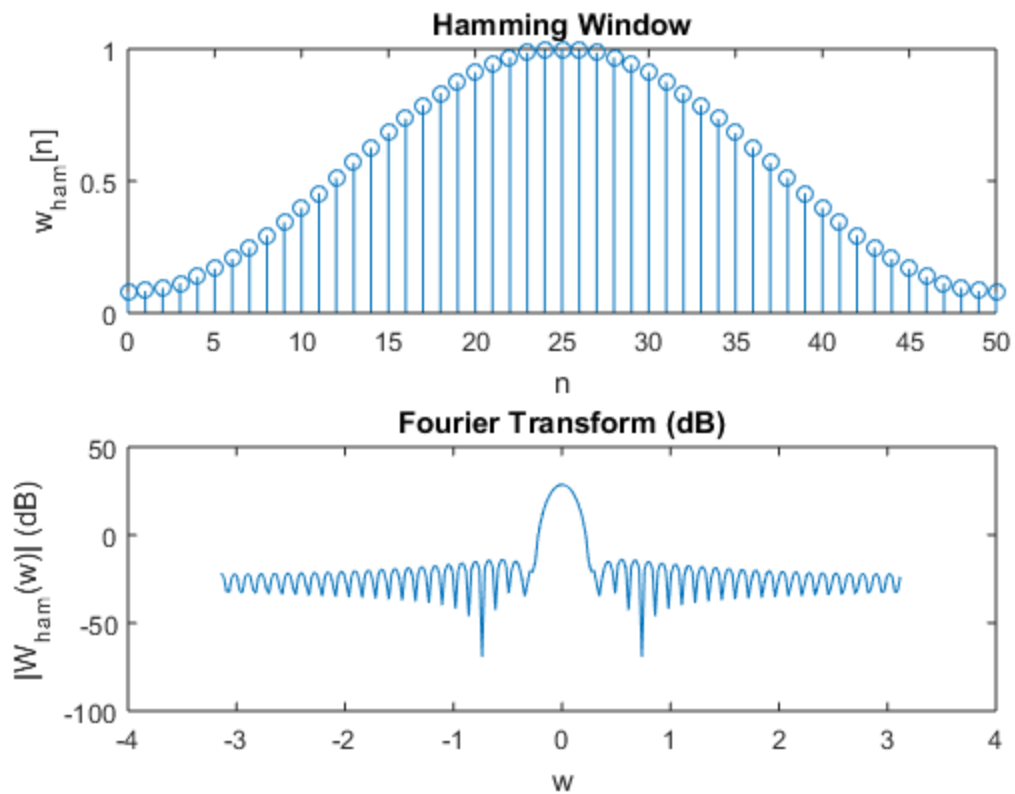
```

w_ham = zeros(1,N);
n = 0;
for k = 1:N
    if (n >= 0 && n <= (N-1))
        w_ham(k) = 0.54 - 0.46*cos(2*pi*n/(N-1));
    else
        w_ham(k) = 0;
    end
    n = n + 1;
end

W_ham = fftshift(fft(w_ham,M));
W_ham_dB = mag2db(abs(W_ham));

figure,
subplot(211), stem(m,w_ham), xlabel('n'), ylabel('w_h_a_m[n]'),
    title('Hamming Window');
subplot(212), plot(w,W_ham_dB), xlabel('w'), ylabel('|W_h_a_m(w)|
    (dB)'), title('Fourier Transform (dB)');

```



Blackman Window

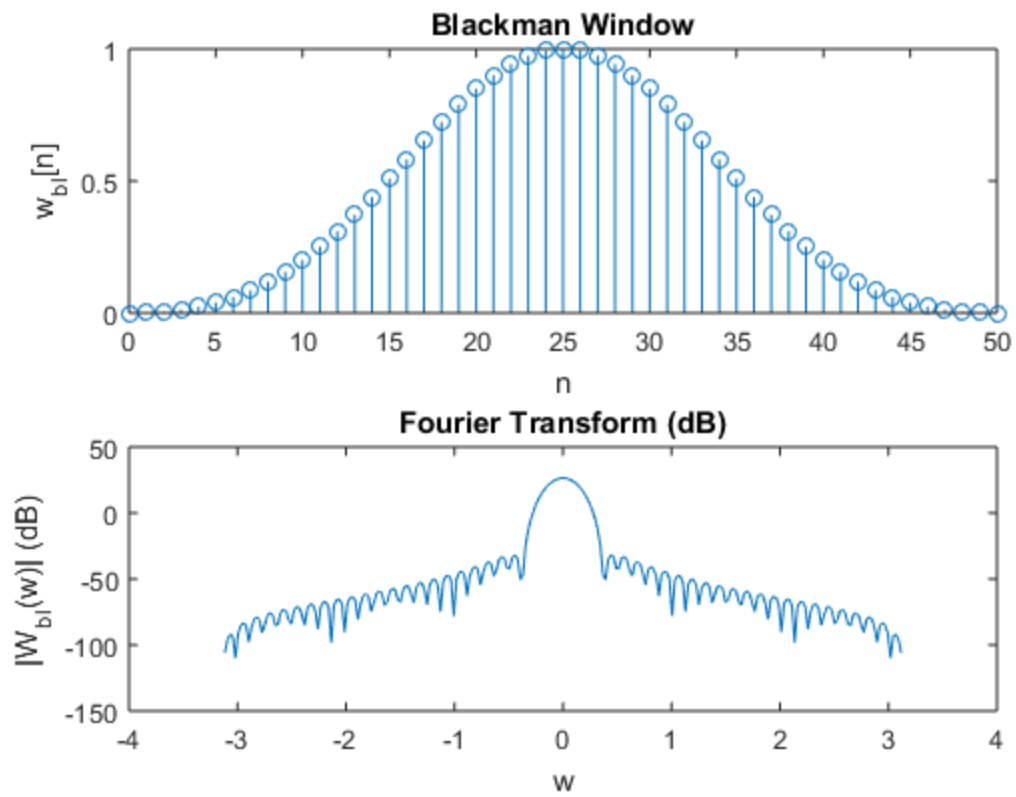
```

w_bl = zeros(1,N);
n = 0;
for k = 1:N
    if (n >= 0 && n <= (N-1))
        w_bl(k) = 0.42 - 0.5*cos(2*pi*n/(N-1)) + 0.08*cos(4*pi*n/(N-1));
    else
        w_bl(k) = 0;
    end
    n = n + 1;
end

W_bl = fftshift(fft(w_bl,M));
W_bl_dB = mag2db(abs(W_bl));

figure,
subplot(211), stem(m,w_bl), xlabel('n'), ylabel('w_b_l[n]'),
    title('Blackman Window');
subplot(212), plot(w,W_bl_dB), xlabel('w'), ylabel('|W_b_l(w)| (dB)'),
    title('Fourier Transform (dB)');

```



Credits

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