Design of FIR using Hanning Window

Hanning Window:

It is also called raised cosine function.

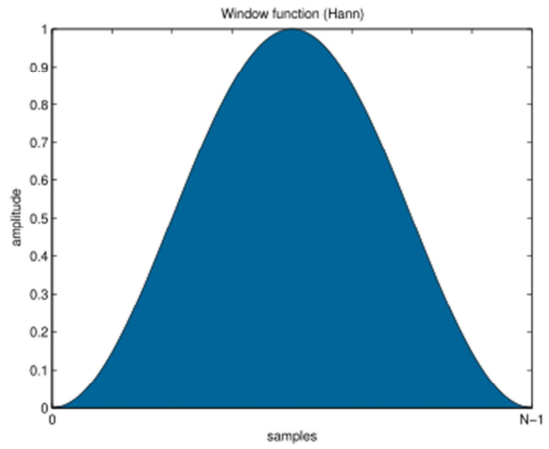
Hann function is given by,

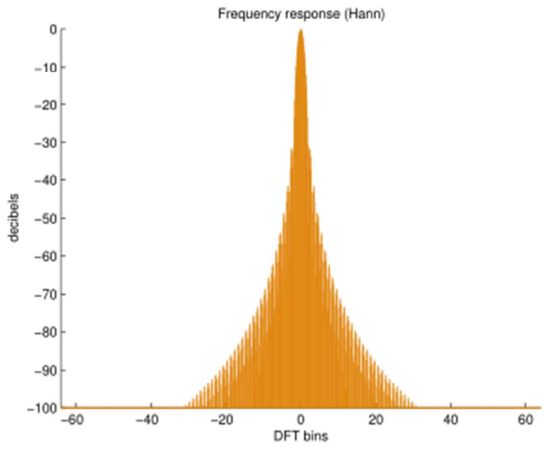
$$w[n] = \begin{cases} 0.5 - 0.5\cos\left(\frac{2\pi n}{N}\right), & 0 \le n \le N-1 \\ 0, otherwise \end{cases}$$

N = length of window.

The ends of the cosine just touch zero, so the side-lobes roll off at about 18 dB per octave. And therefore, better frequency localization compared to rectangular window. And also, it can be noticed that there no discontinuity at the ends.

The main advantage of this window function over rectangular window function is that the first side lobe is 18 dB below the main lobe and hence, the problem of spectral leakage is solved. And the problem of ripples in passband and stopband is also solved.





References:

- CC Studio examples.
- TMS320C6713 Datasheet, User Manual (and supporting documents).
- http://en.wikipedia.org/wiki/Finite_impulse_response.
- http://www.labbookpages.co.uk/audio/firWindowing.html.