The DFT is defined as:

Find a direct expression for the DFT of a rectangular window. Due to the finite size of the DFT, this can be approximated but is not equal to the sinc(x) function.

Truncated to size M, centered:

If M is odd the rectangular window is symmetric around x=0, so the complex phase reduces to zero:

Note that this is an even function of n.

It worked! Encouraged by this, let’s just try the Voigt function in its entirety:

Sxk/(a2+k2)

1;-ia;1-ia;x 1;ia;1+ia;x

2a2

Let’s do a bit easier: