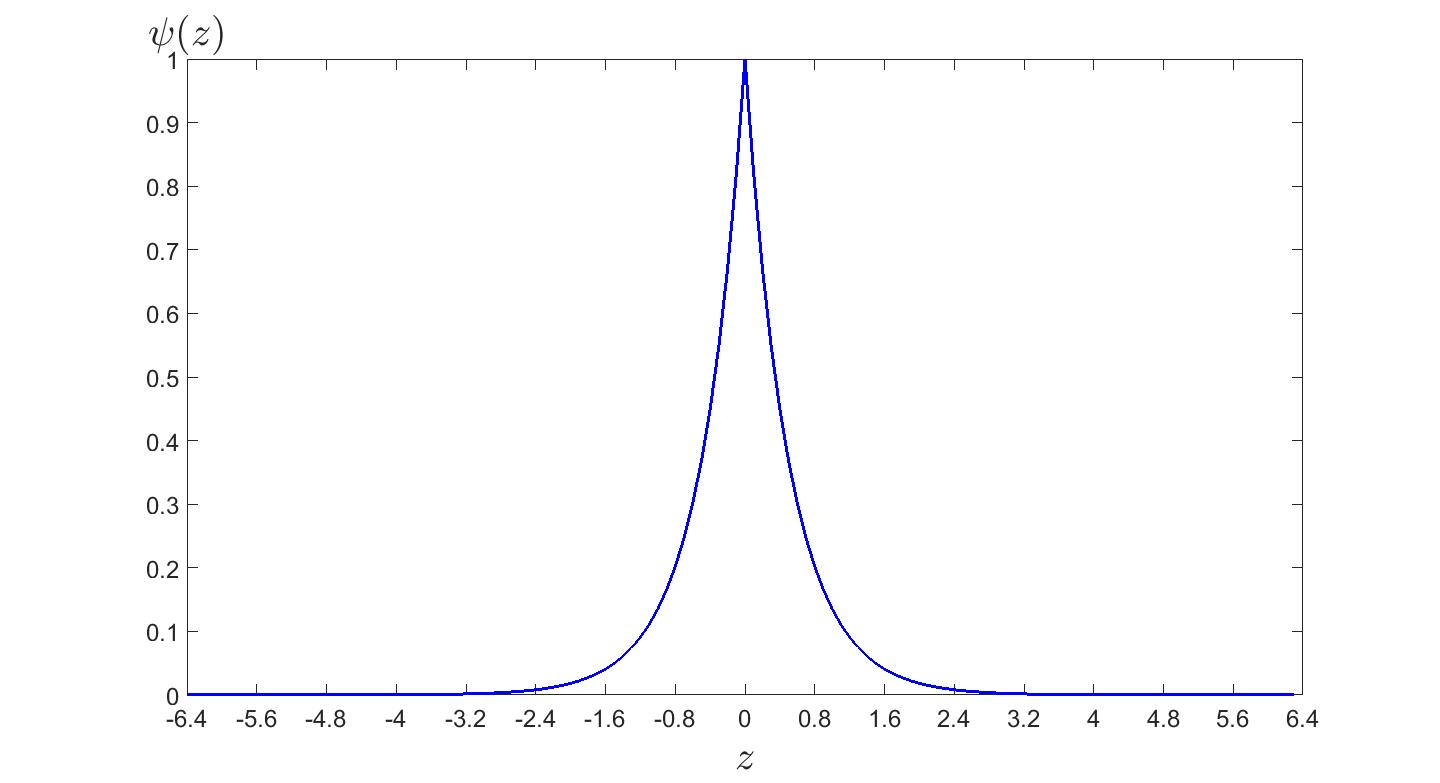
Different between FT, FFT and DFT

PART.1

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |

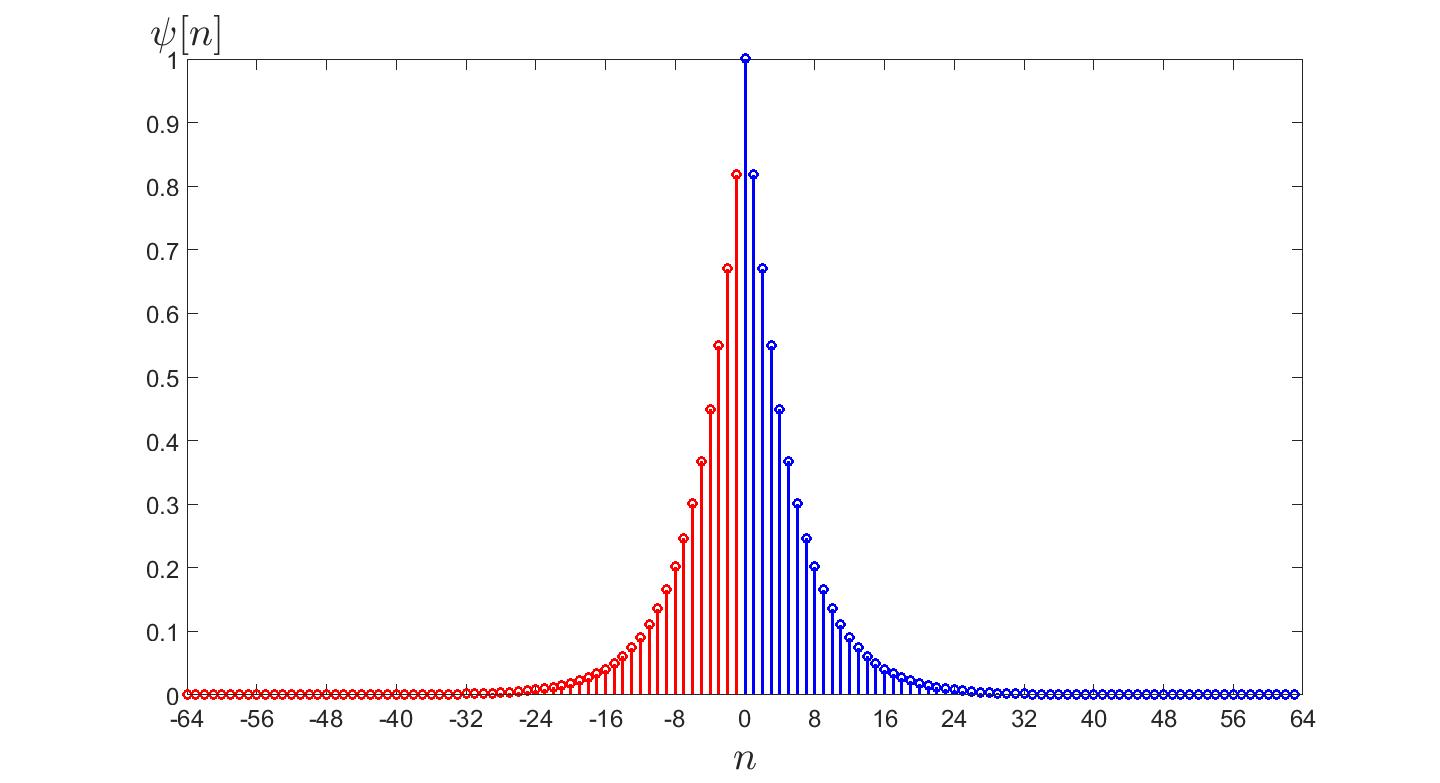
Let in the range , and zero otherwise.



The Fourier transmission (FT) form of is

And out the range , .

Let , where n is integer.

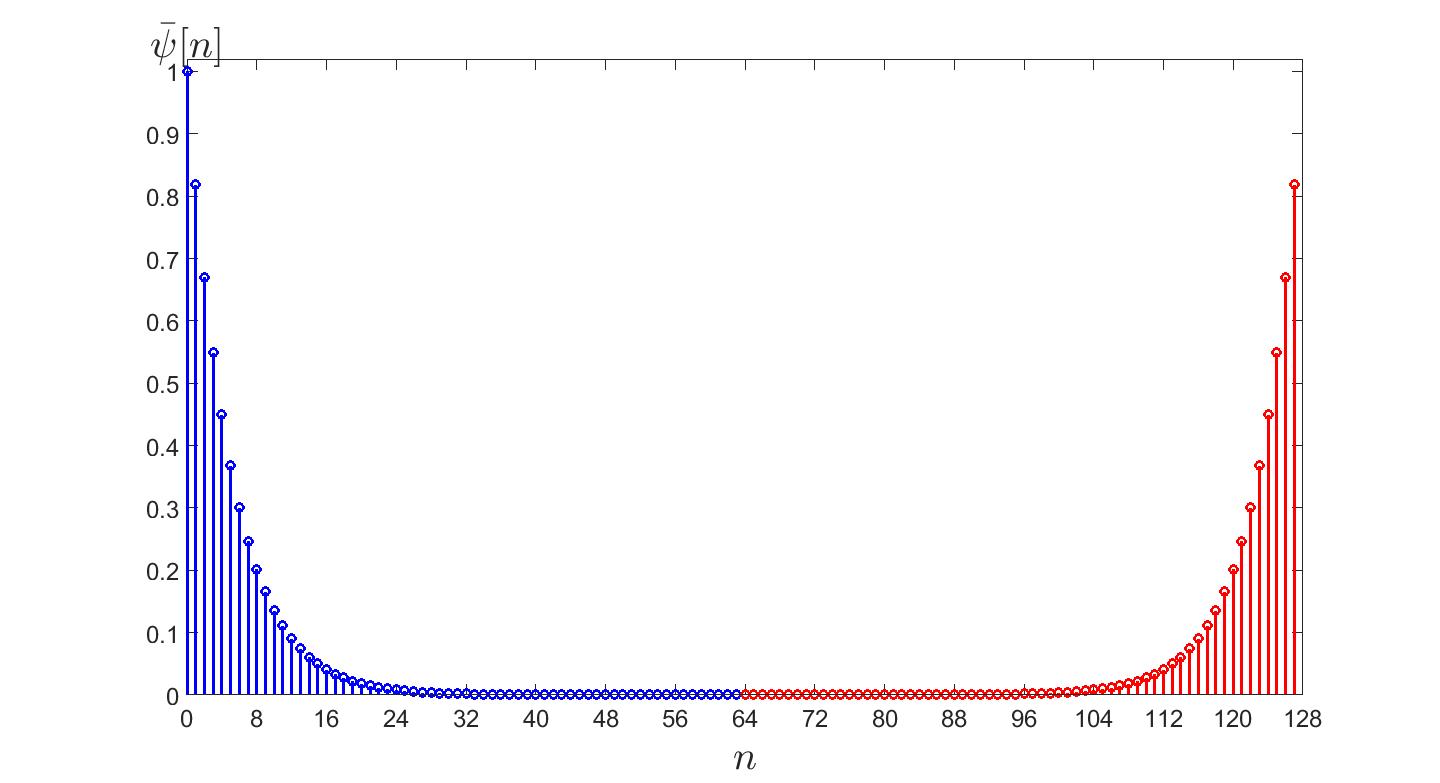


Then the DFT form is

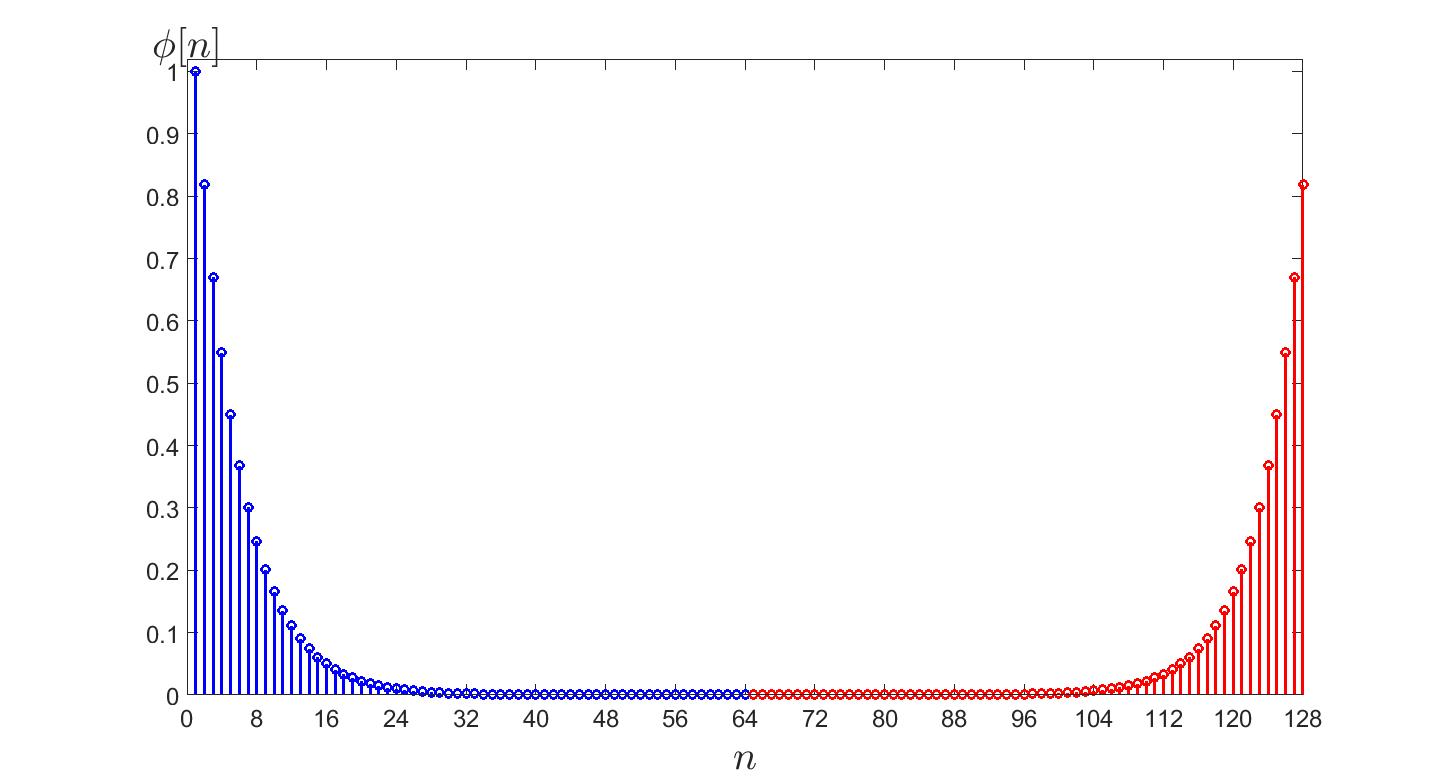
(DFT)

,where m is integer.

To find the DFT form by Matlab, we first move part of which is in range to the range , and named this function .



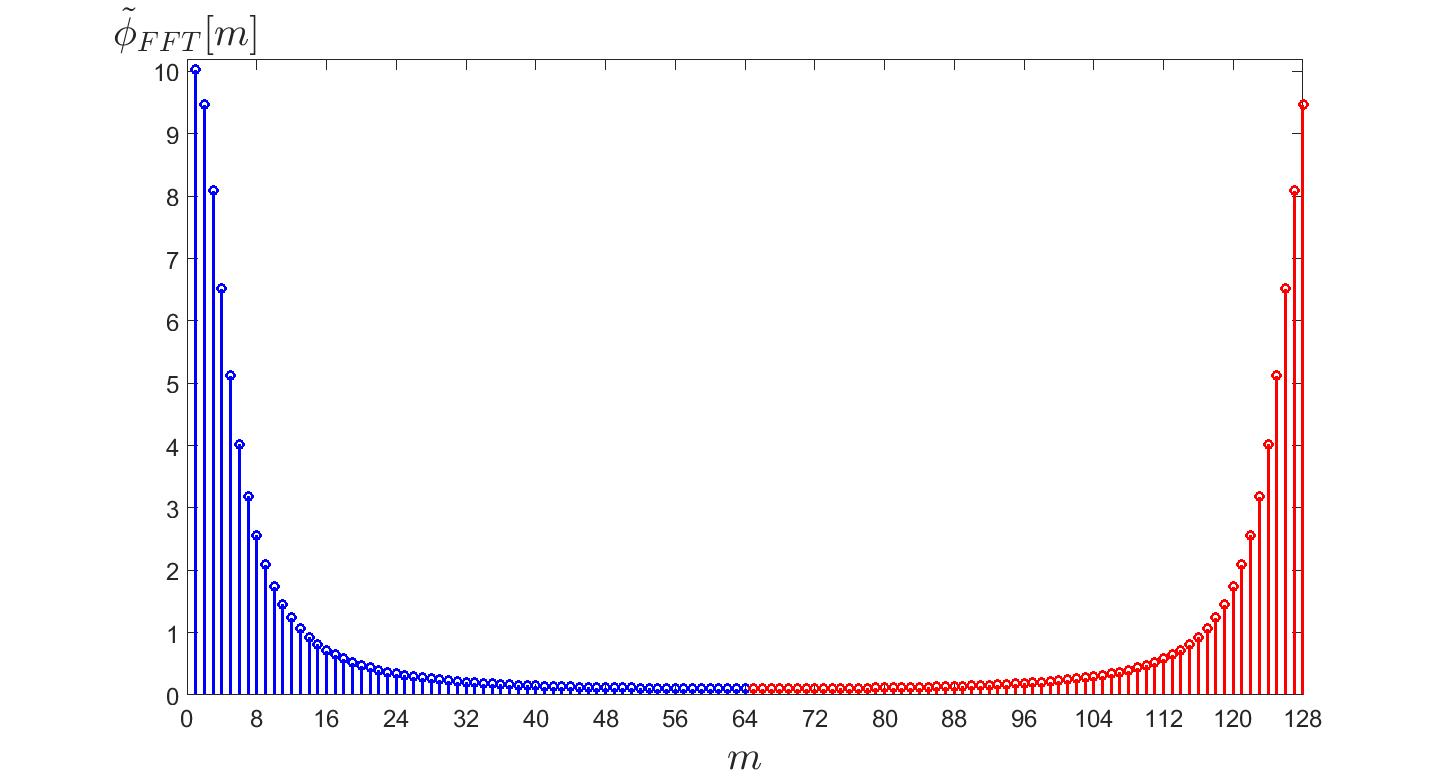
Shift one point positive, we obtain .



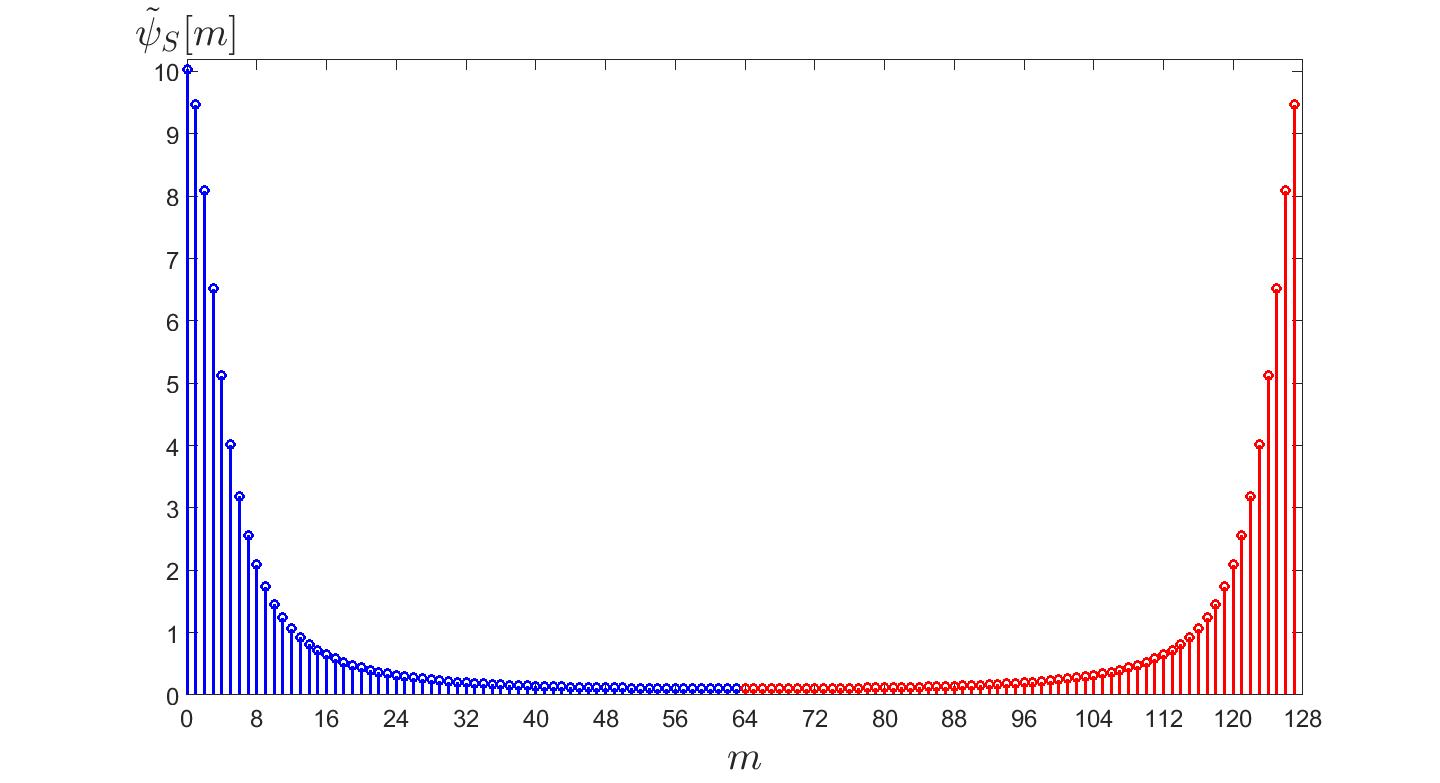
And use Fast Fourier transform function in Matlab

(FFT)

, we obtain:



We assump ,



move the part which is in range to rang and times , we obtain the DFT form :

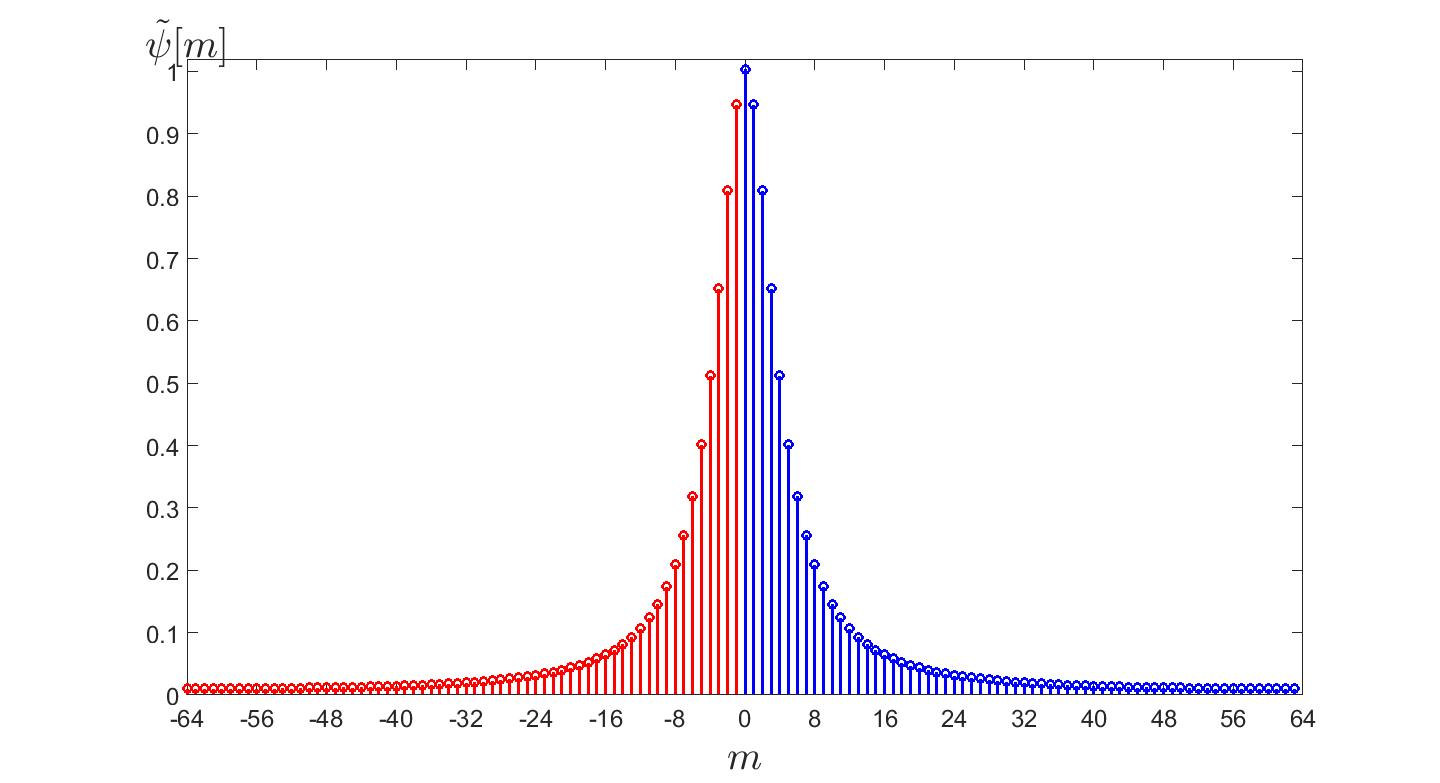
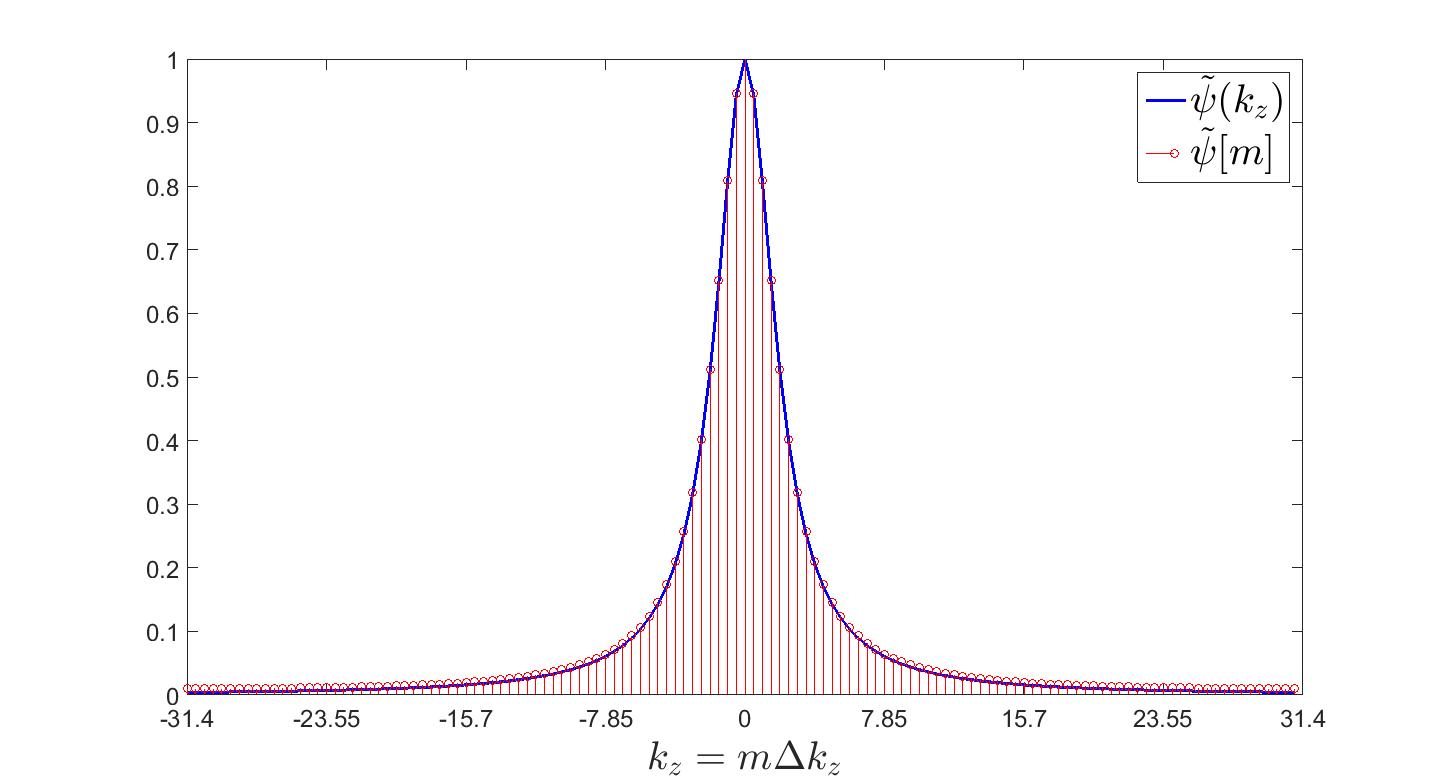
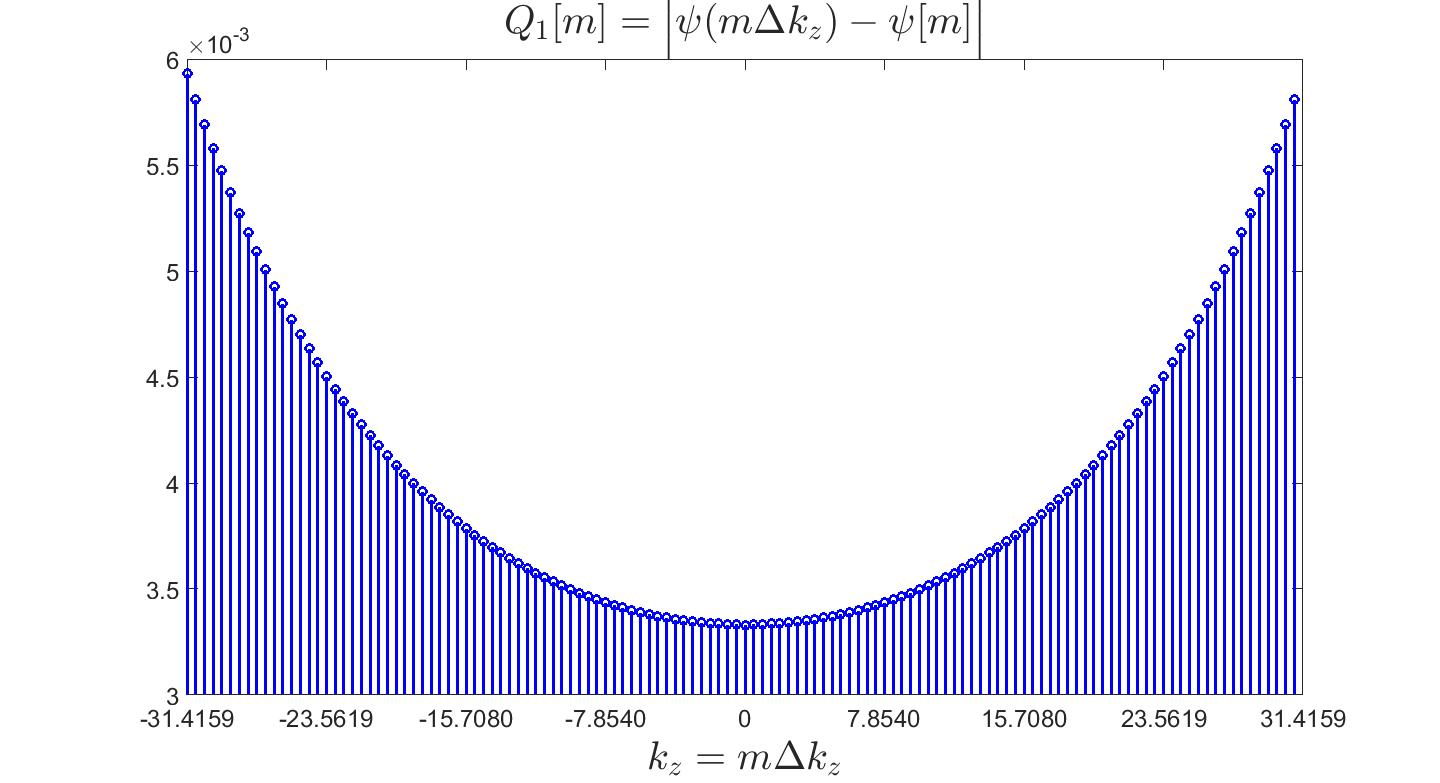


Figure below showed the compare with .



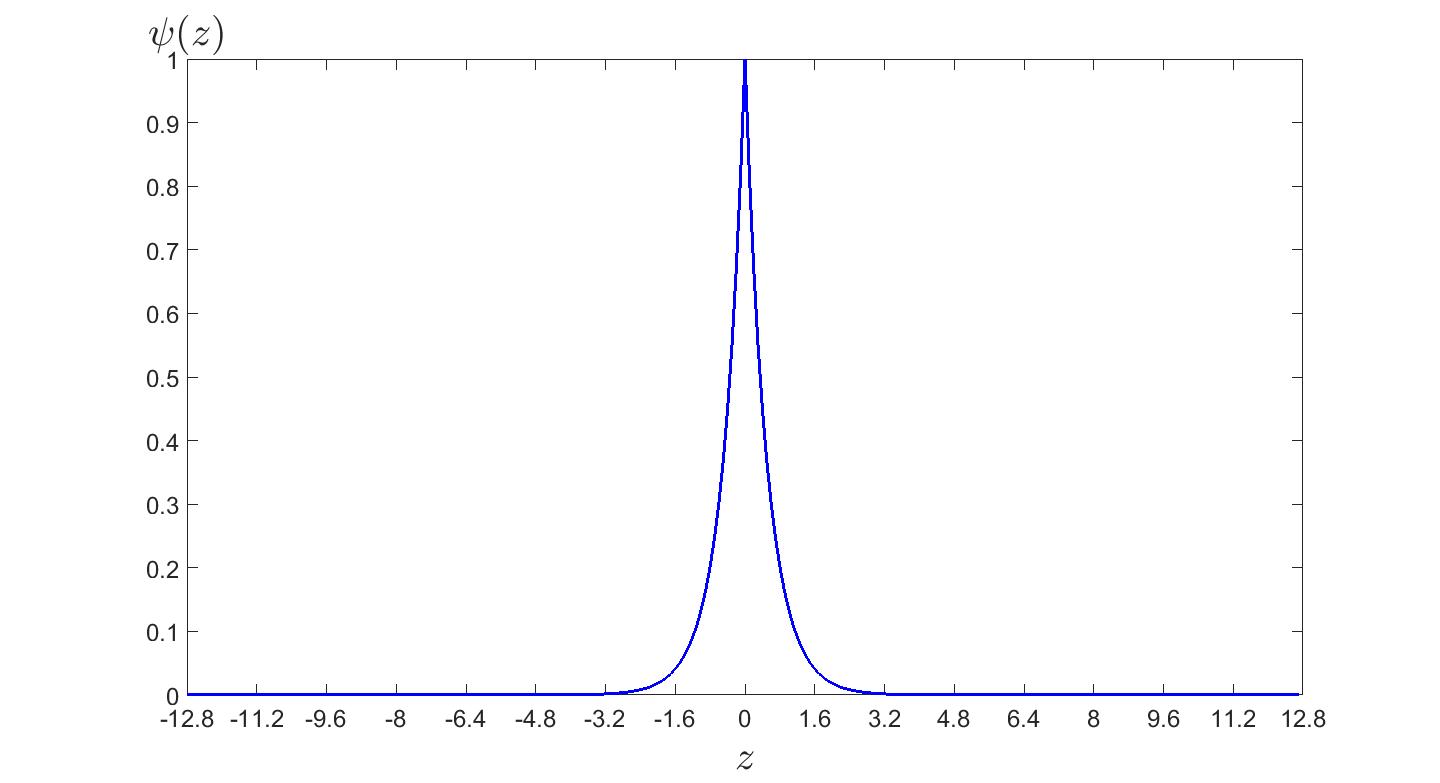
Now we let



PART.2

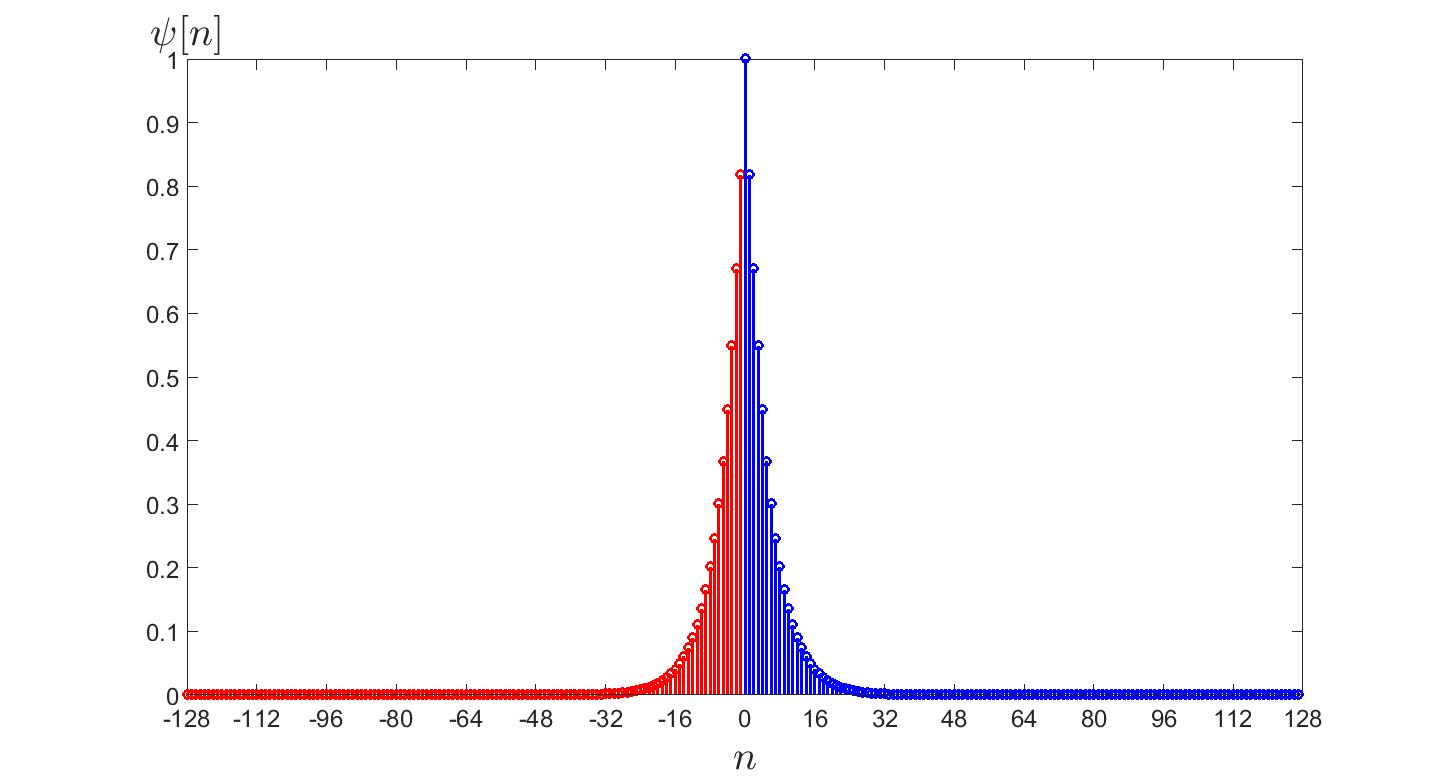
|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |

In part.2 we extend the z-domain of for , let in the range , and zero for or .



The Fourier transmission (FT) form of is

Let , where n is integer.

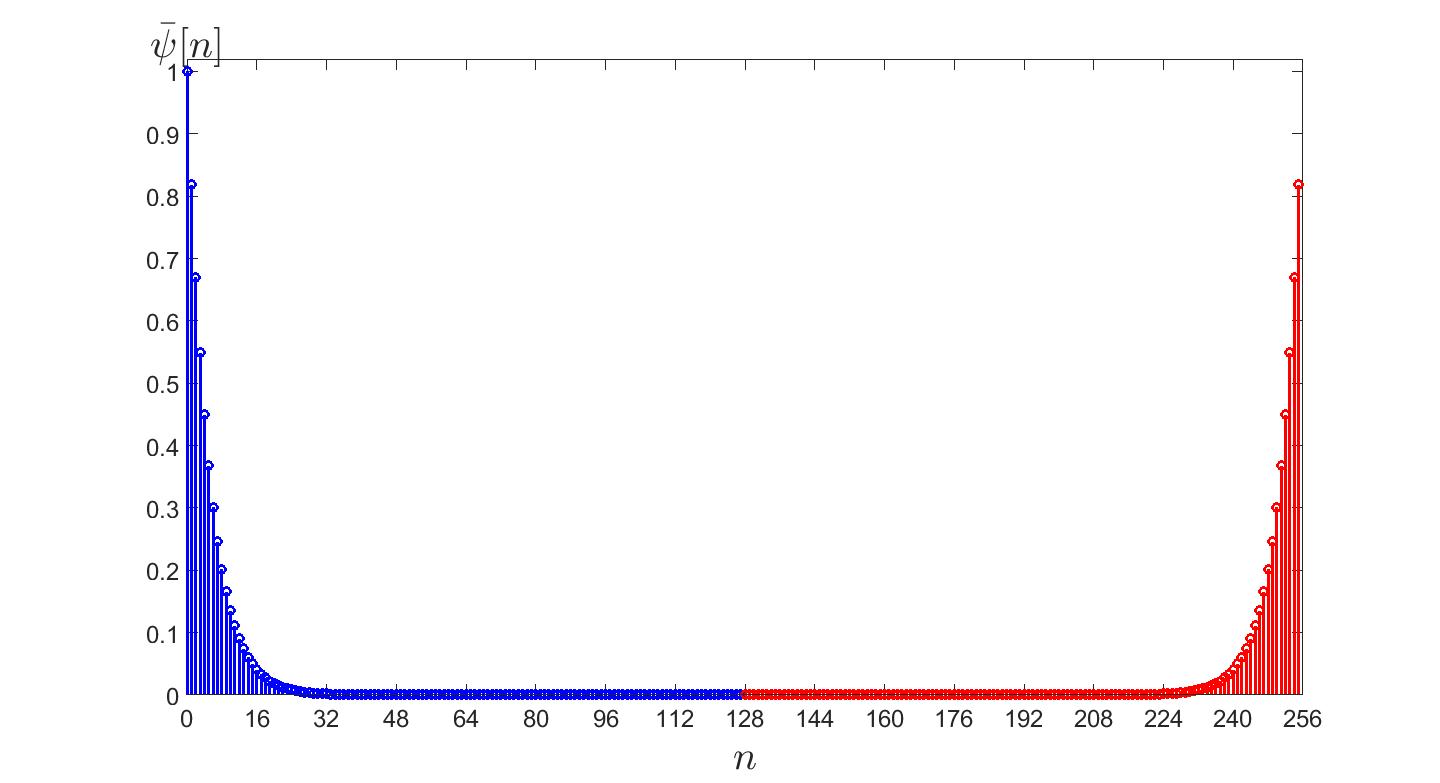


Then the DFT form is

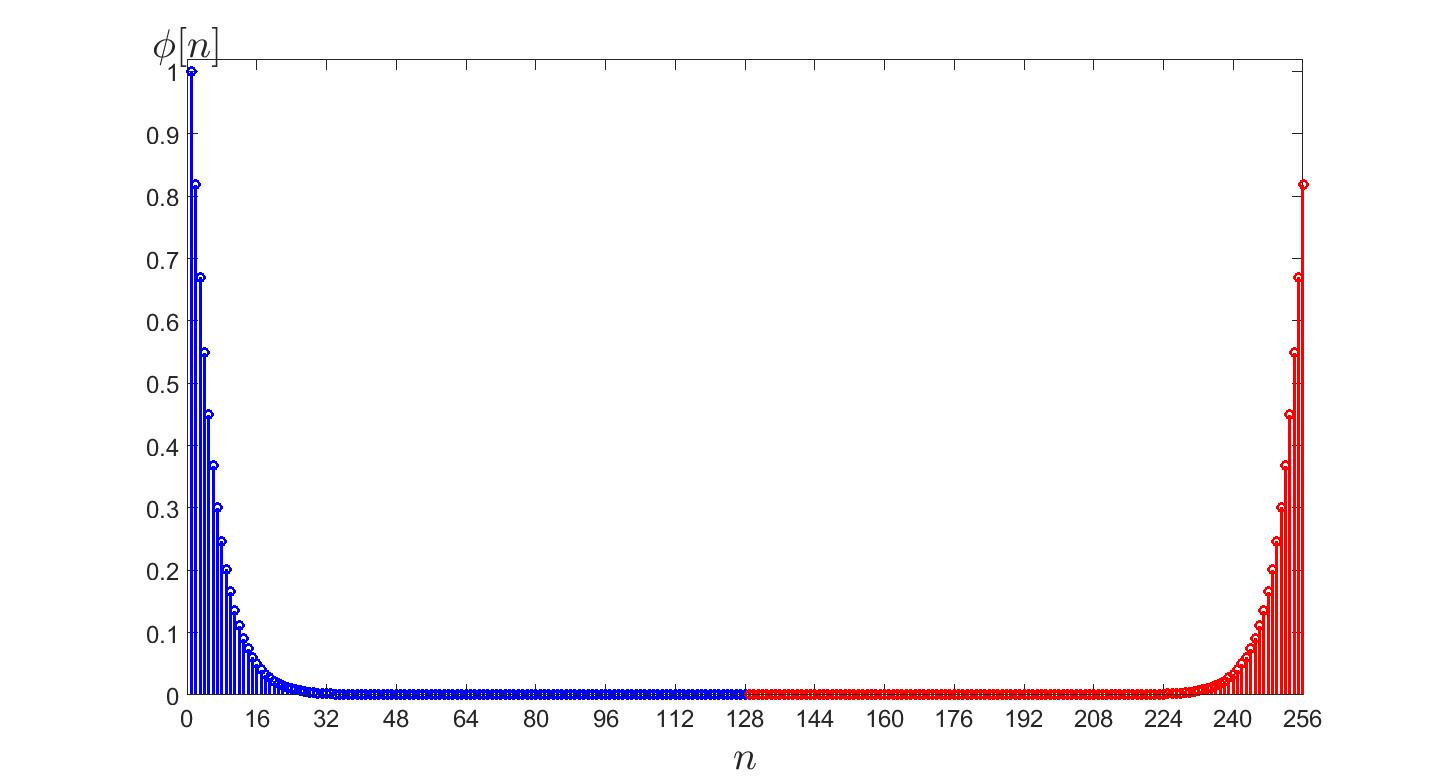
(DFT)

,where m is integer.

To find the DFT form by Matlab, we first move part of which is in range to the range , and named this function .



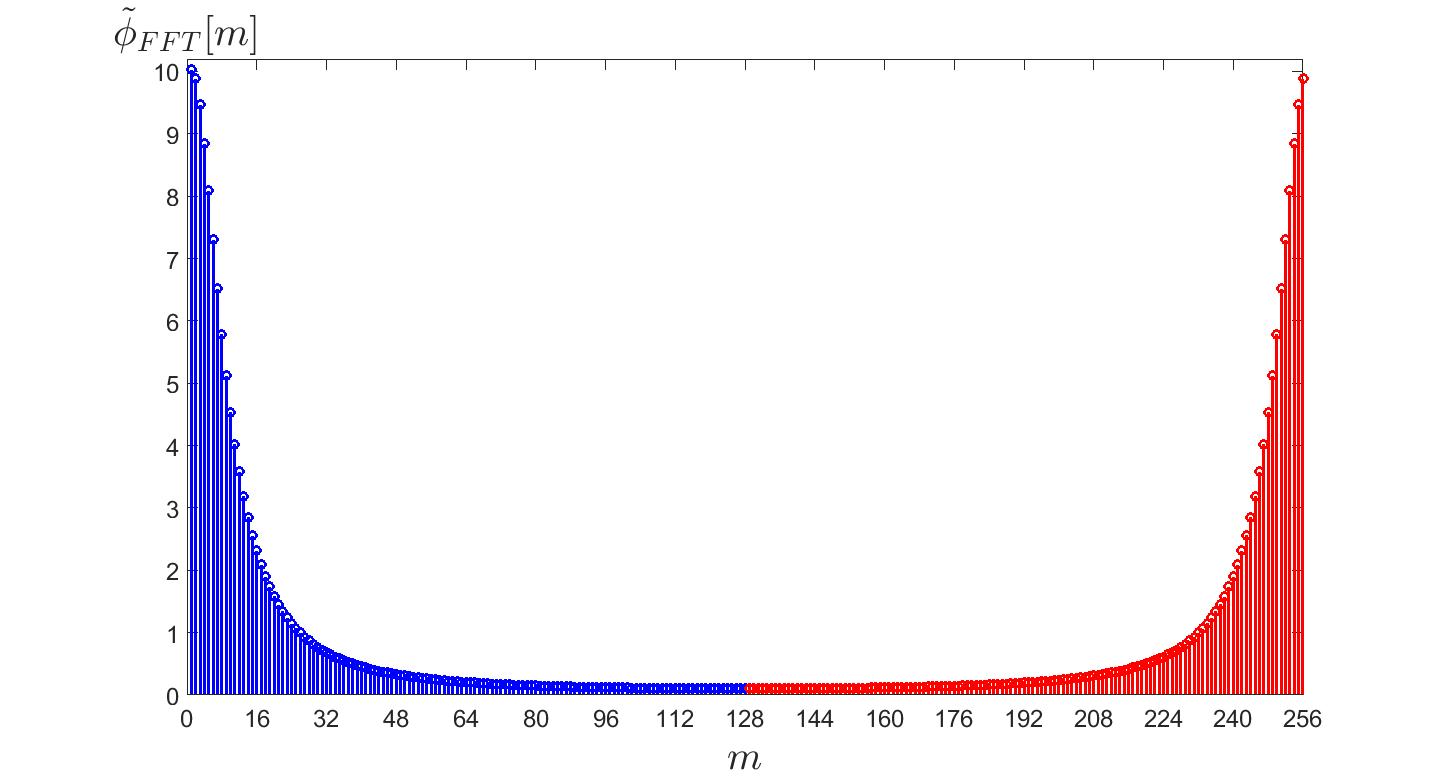
Shift one point positive, we obtain .



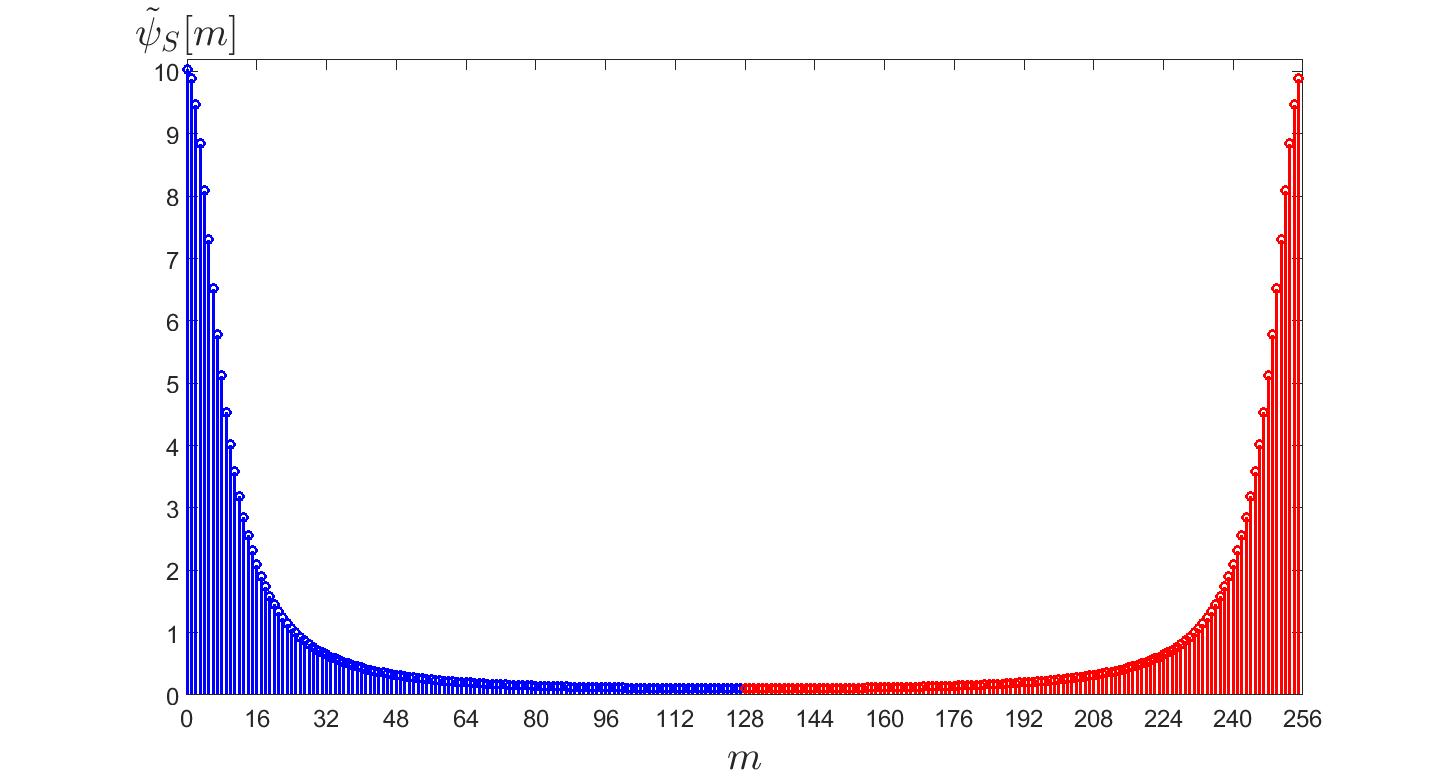
And use Fast Fourier transform function in Matlab

(FFT)

, we obtain:



We shift back one point, get ,



move the part which is in range to rang and times , we obtain the DFT form :

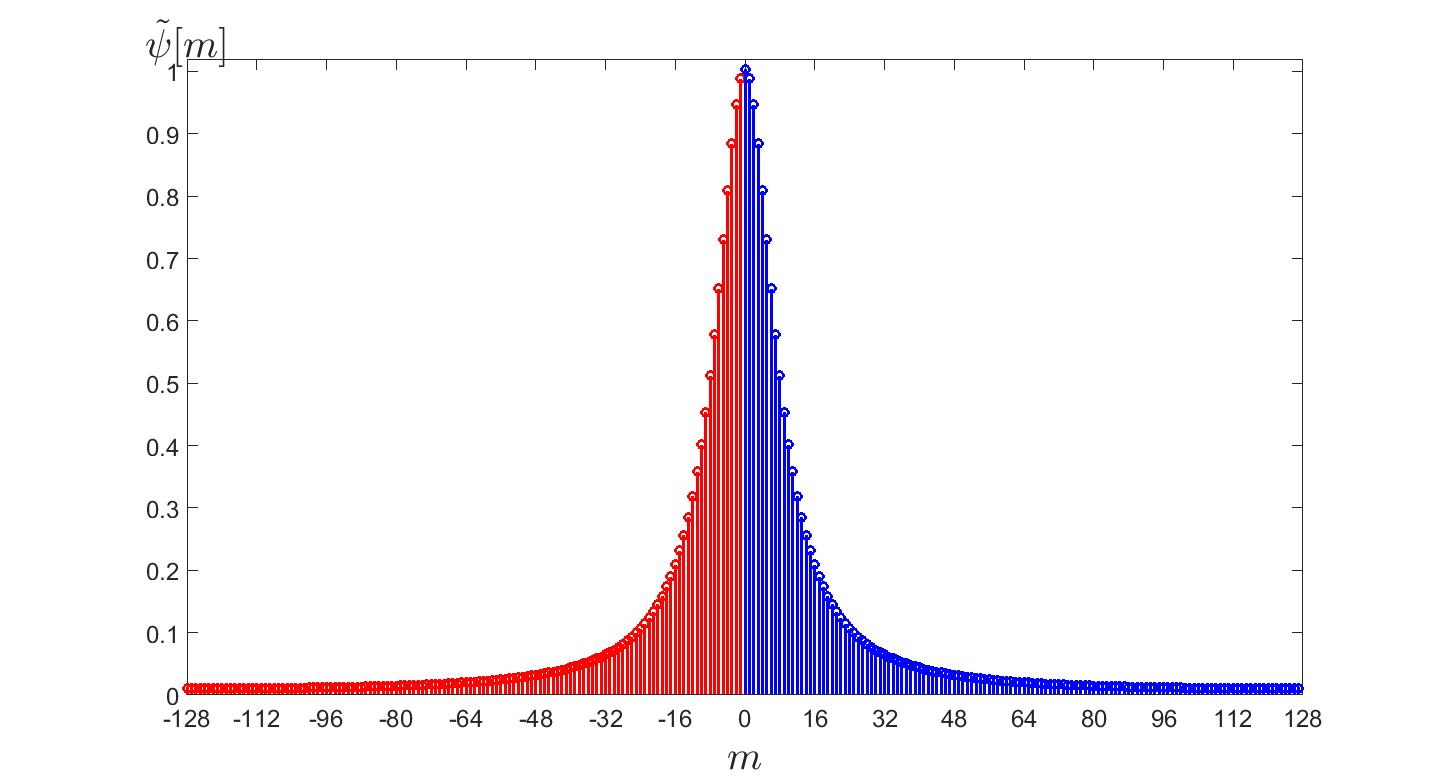
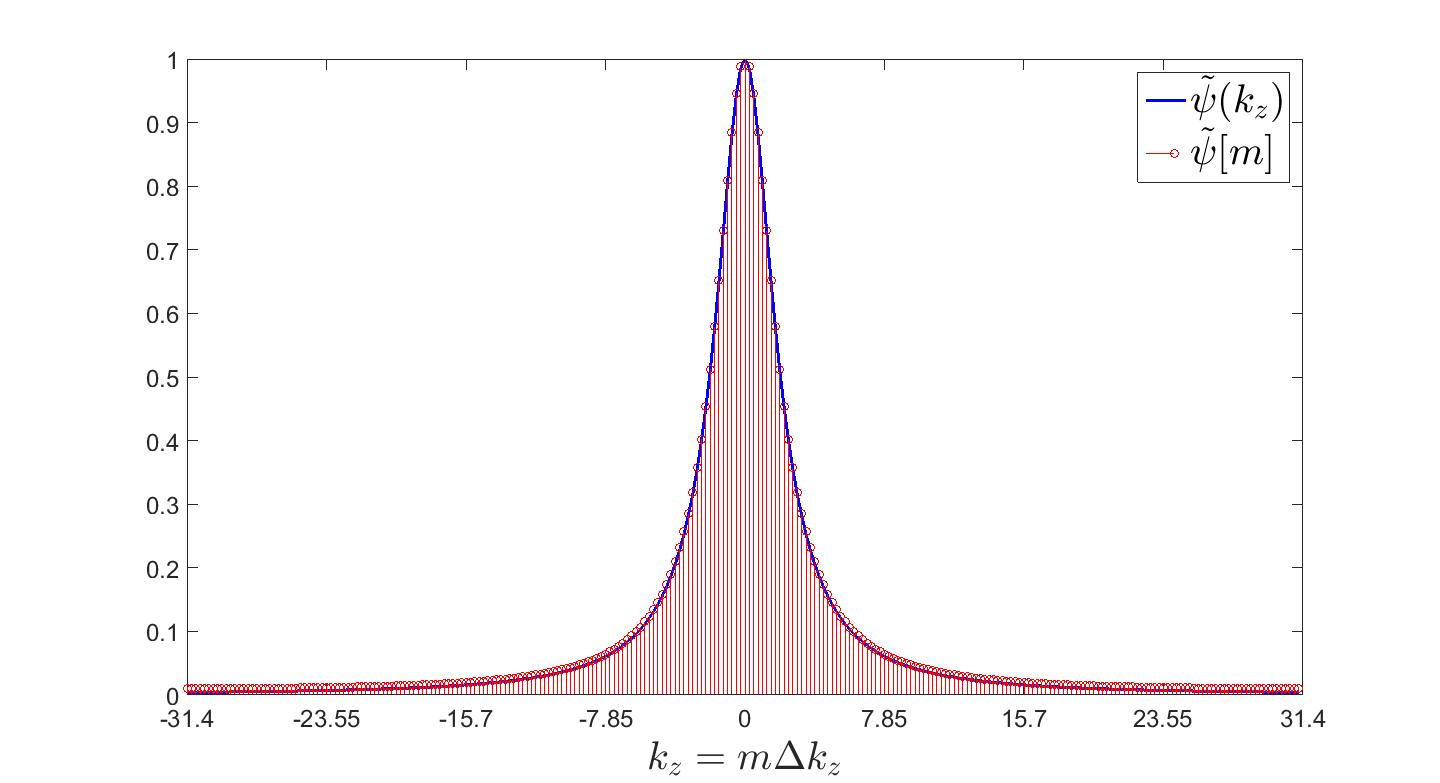
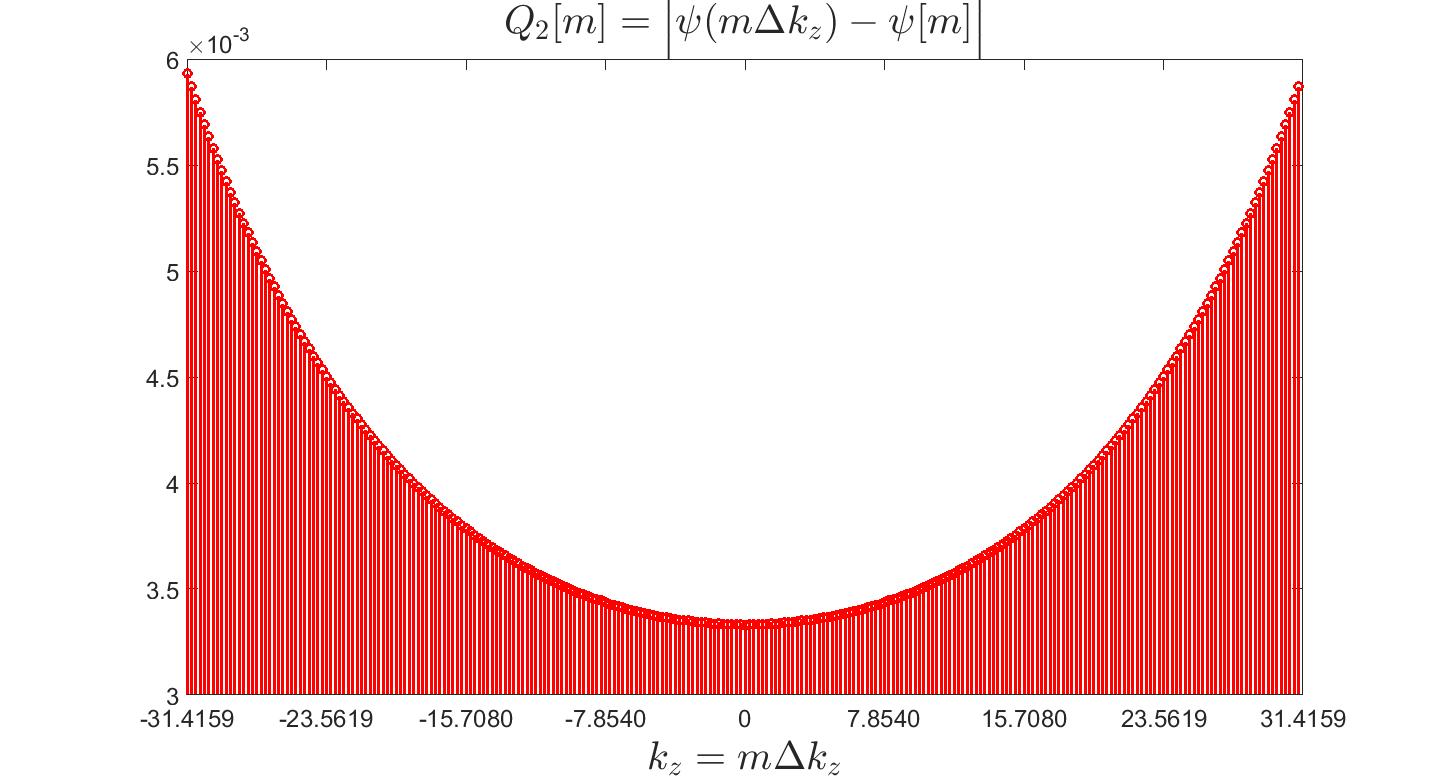


Figure below showed the compare with .



Now we let ,

PART.3

Compare in part.1 with in part.2.

