2D CFAR

Note : The initial position is set to 80m and the initial velocity is set to 35m/s.

Implementation steps for the 2D CFAR process.

Steps are followed as per the guidance provided in lesson 4 “CFAR 2D”.

- Number of training cells, guard cells are chosen.
- Through ‘for’ loops the Cell under Test (CUT) is slide across the complete cell matrix.
- The signal noise level contained in all the training cells are added and an average is taken for finding the threshold.
- The offset is added to the threshold for maintaining the False alarm to a minimum.
- The signal level at the CUT is determined and if it is greater than the threshold then it is equated to 1 else it is set to zero.

Selection of Training, Guard cells and offset.

The number of Training cells for both the dimensions (range, doppler) are set to the respective values :

```
Tr_cell_range = 10;          % Training cell in range dimension
Tr_cell_doppler = 8;        % Training Cell in doppler dimension
```

Through the guidance presented in the course material in lesson 4 “CFAR 2D” the initial combination were started with 8,4 respectively and subsequently set to 10, 8, it was observed that for this combination the result could be observed.

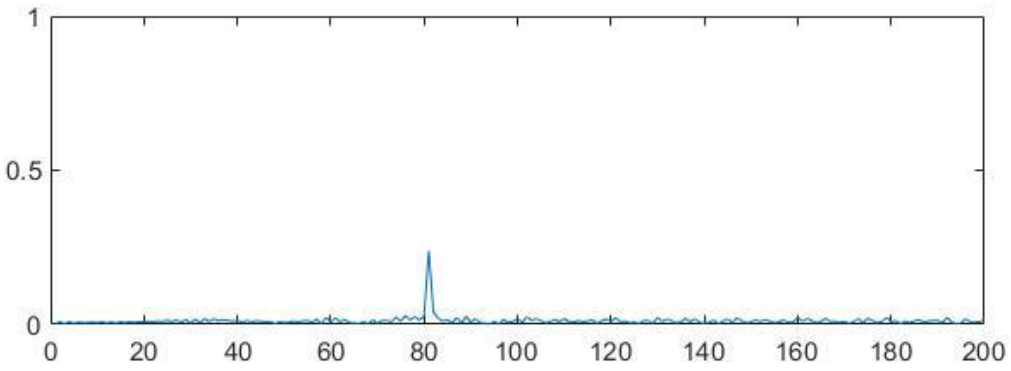
Similarly, the guard cells were started with 4,2 for respective dimensions along range and doppler and subsequently modified to 4,4.

```
Guard_cell_range = 4;        % Guard cell in range dimension
Guard_cell_doppler = 4;      % Guard cell in doppler dimension

% offset the threshold by SNR value in dB
Offset = 1.2;
```

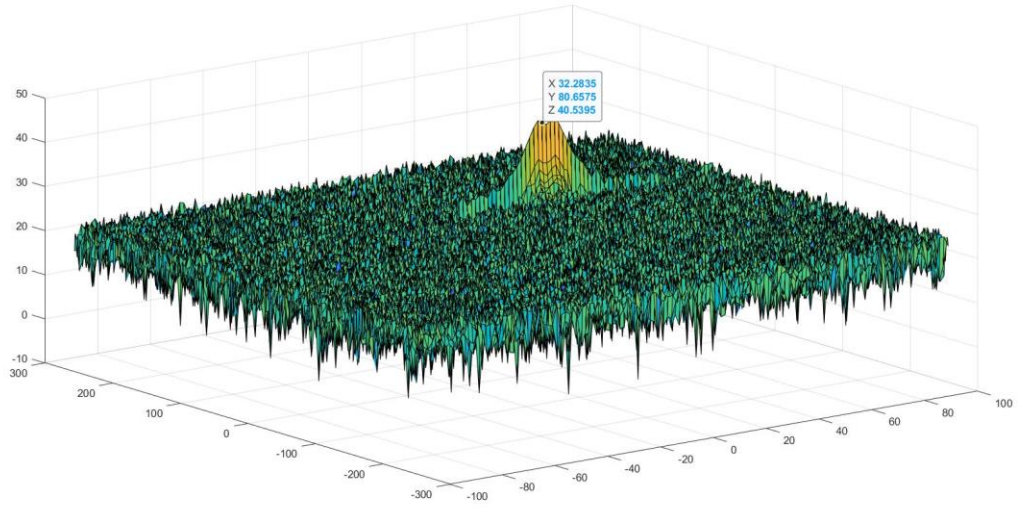
Steps taken to suppress the non-thresholded cells at the edges.

The CUT are not located at the edges , as the training cells are occupying the edges. These are set to 0 , through collection of edge indices and set the values at those indices to 0.

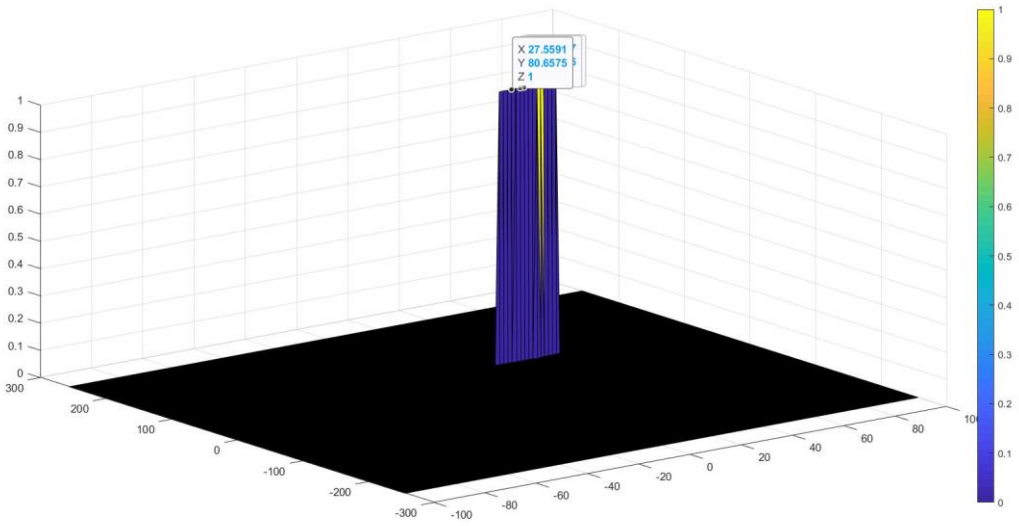
```
[R, C] = size(RDM);

RDM(union(1:(Tr_cell_range+Guard_cell_range), R-
(Tr_cell_range+Guard_cell_range-1):R), :) = 0;

RDM(:, union(1:(Tr_cell_doppler+Guard_cell_doppler), C-
(Tr_cell_doppler+Guard_cell_doppler-1):C)) = 0;
```



1.Range from 1st FFT



2. Range Doppler Response



3.CFAR_Implementation