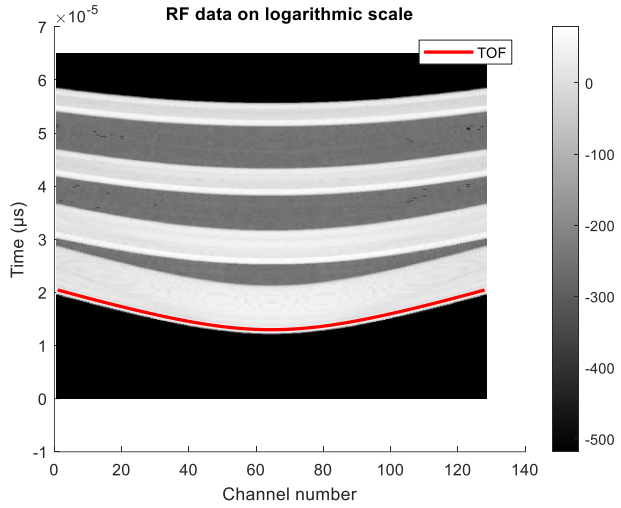
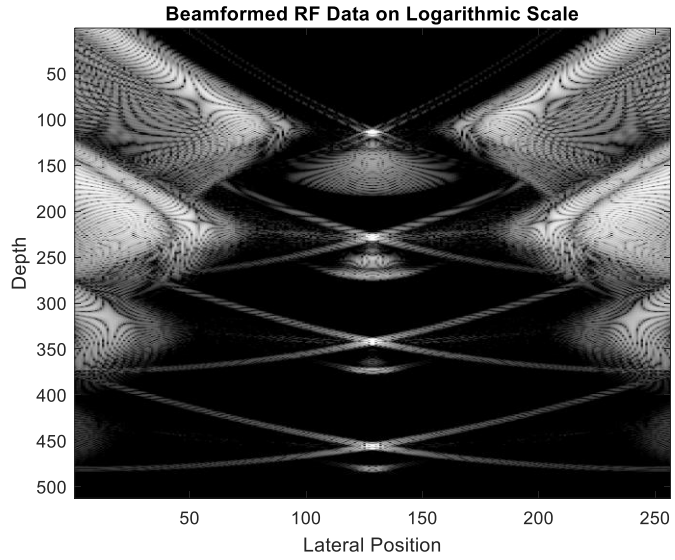
Richard Jacobsen 19.02.2024

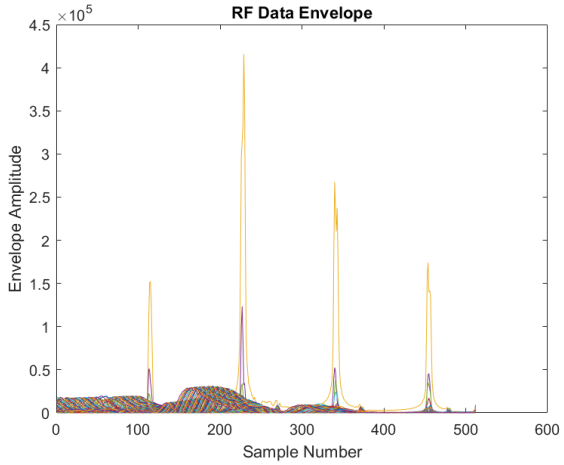
Exercise 6

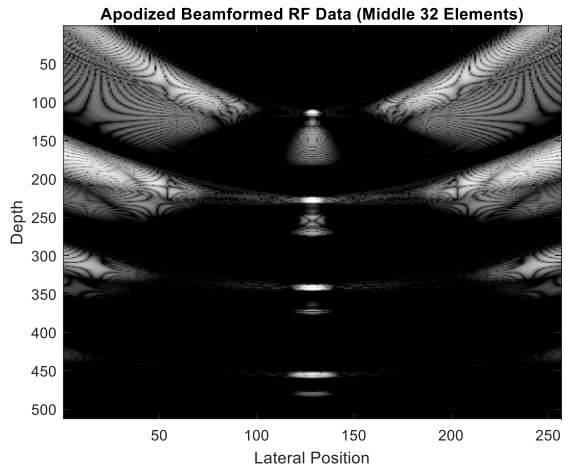
Task 1

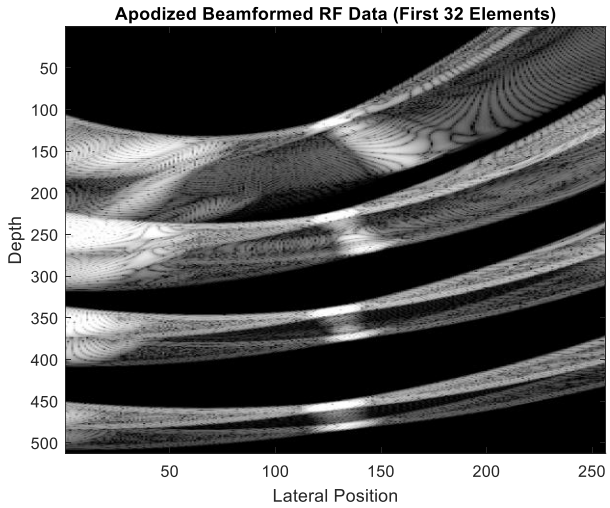


Task 2:

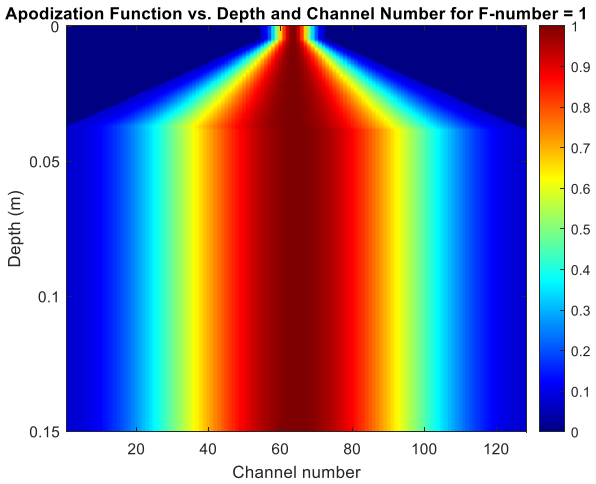




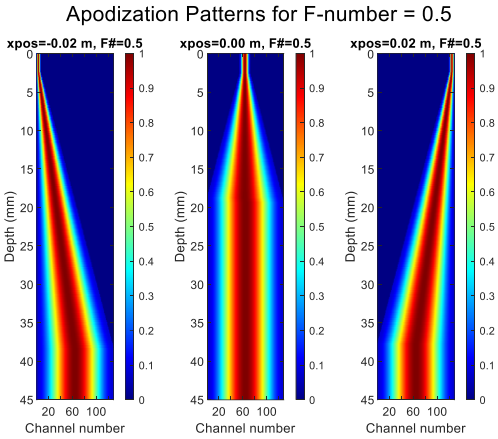


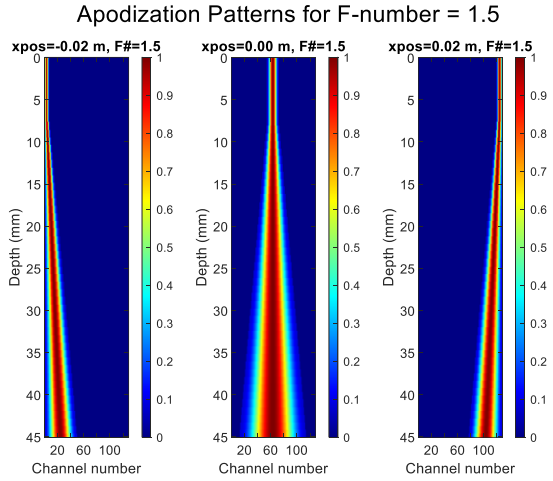


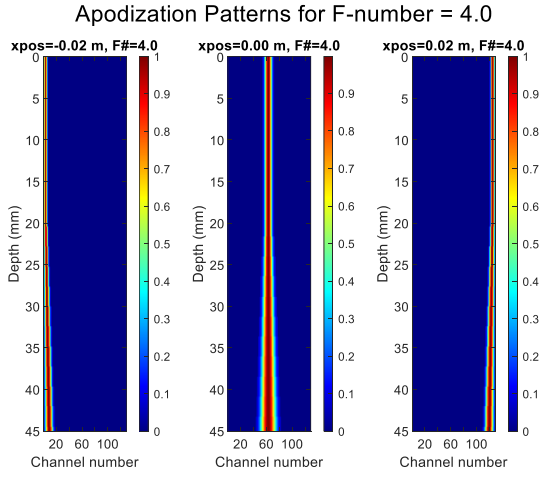
Task 3:



Below depth 0.04m, the aperture can't expand further. This depth is the point beyond which it's impossible to maintain a constant F-number.

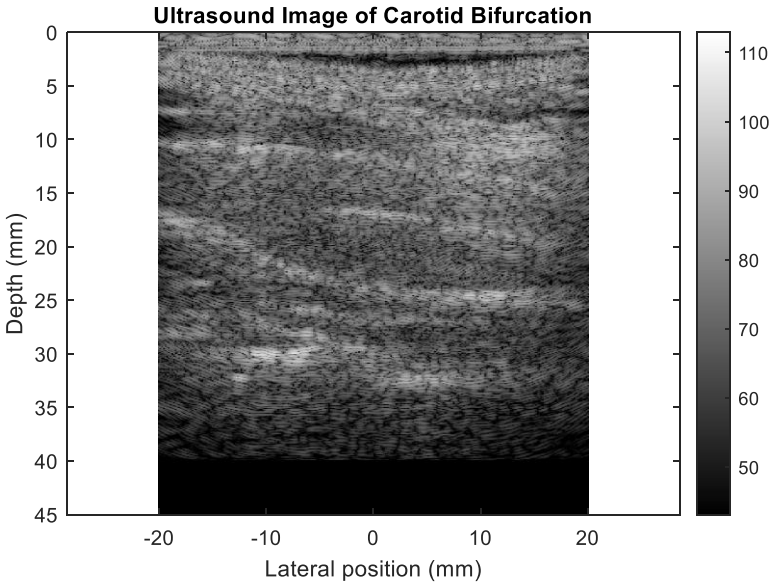






When the F-number increases, it becomes easier to maintain constant F-number with increasing distance. This is because the aperture can expand for longer. A large F-number means a narrower starting aperture and it increases the depth of field but reduces the lateral resolution due to smaller number of elements contributing to the beam.

Task 4:


Ultrasound Image of Carotid Bifurcation
Depth (mm)
0
5
10
15
20
25
30
35
40
45
-20
-10
0
10
20
Lateral position (mm)
110
100
90
80
70
60
50