

DESIGN OF PARABOLIC REFLECTOR ANTENNA

1. Parabolic reflector antenna is designed with a fixed frequency of 10GHz with a varying radius of 0.05 m, 0.075 m, 0.1 m. After simulating, it was observed that the highest radius of 0.1 m has the highest gain. It is concluded that radius and gain are directly proportional in a fixed frequency setting.

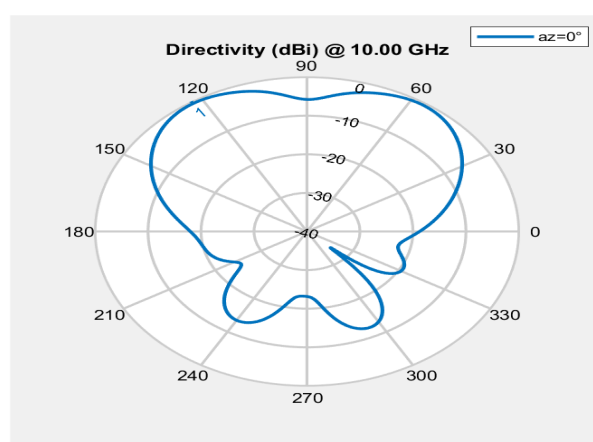
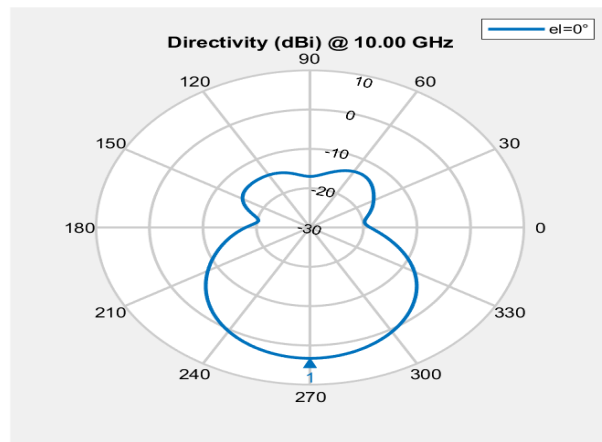
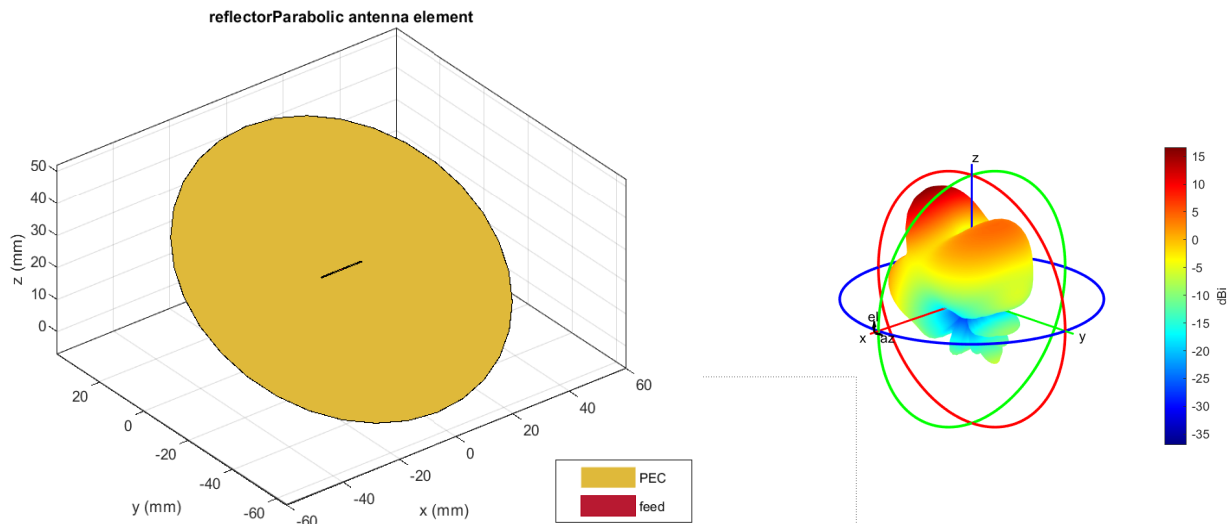
The resultant gain obtained for different radius is listed below -

1. R = 0.05 m

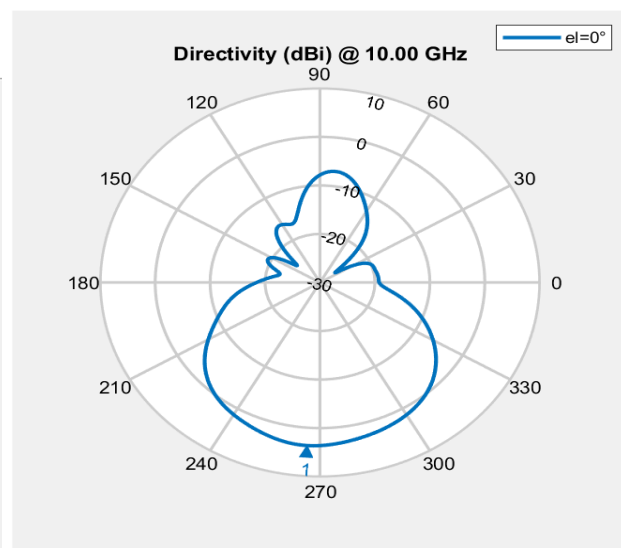
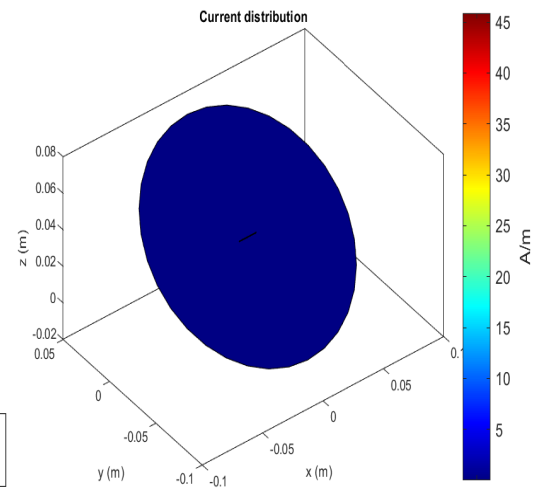
Efficiency = 0.25

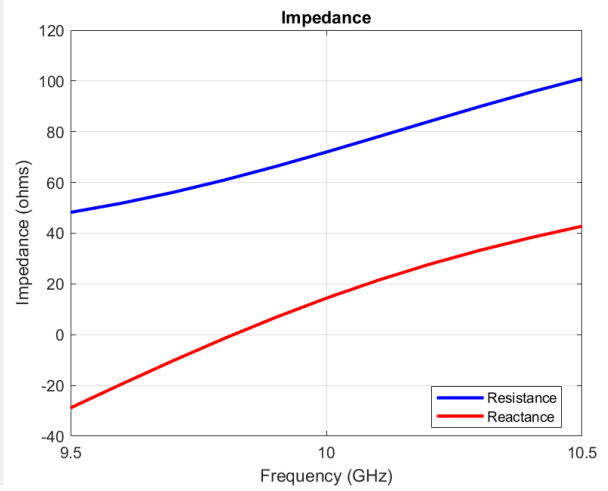
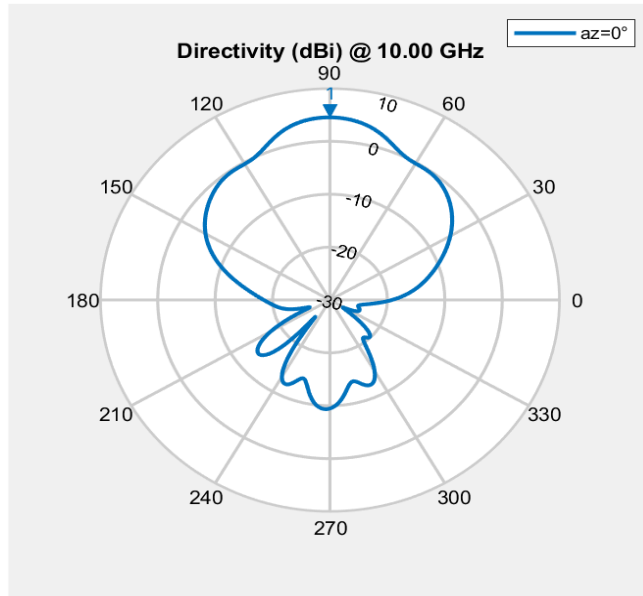
Beam Width =21

Gain(dB) =14.38

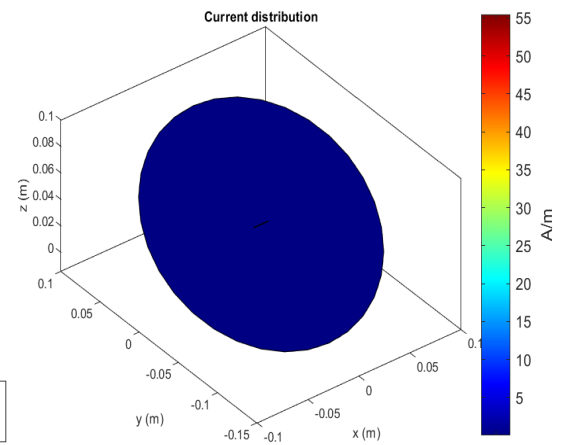
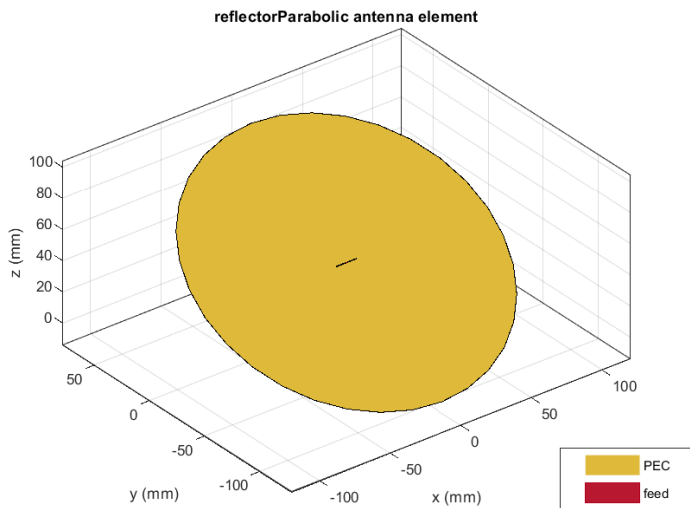


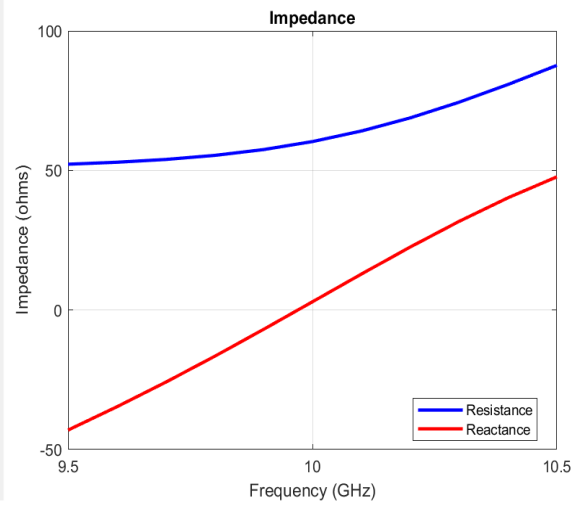
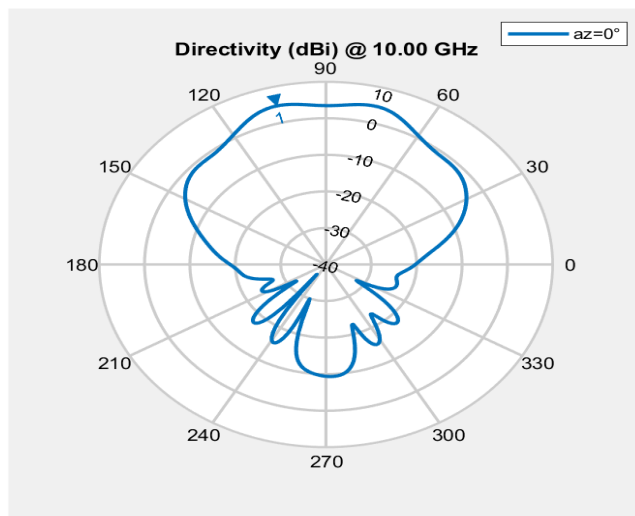
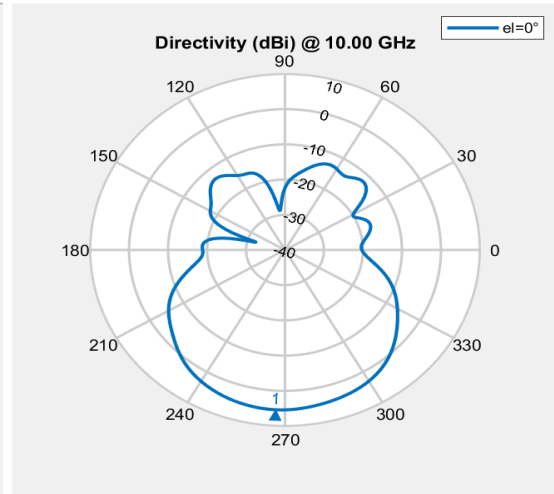
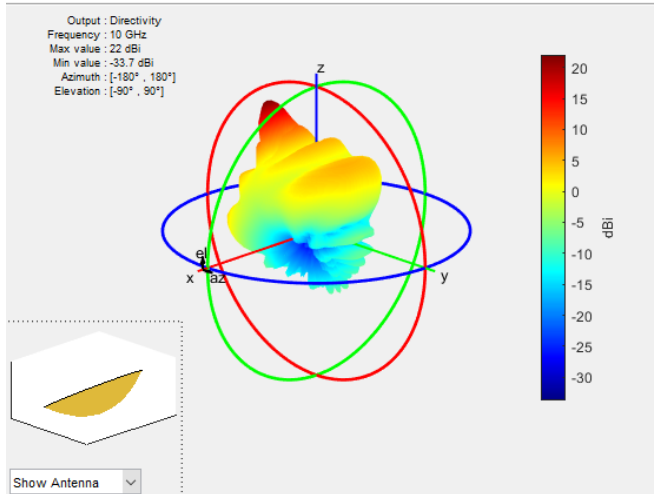
Gain(dB) =17.9018





3. $R = 0.1$ m
Efficiency = 0.25
Beam Width = 10.5
Gain(dB) = 20.4006





2. Parabolic Reflector has been designed for different frequencies of 2.5 GHz and 7.5 GHz.

This has a fixed radius of 0.029979 and focal length of 0.01499. After the simulation, it is determined that gain is directly proportional to frequency.

7.5 GHz has more gain than 2.5 GHz.

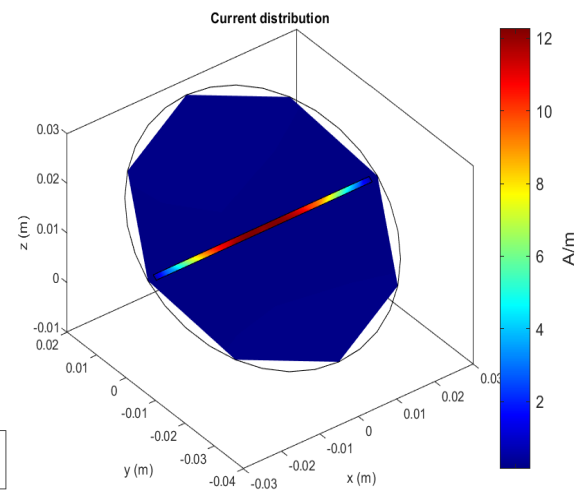
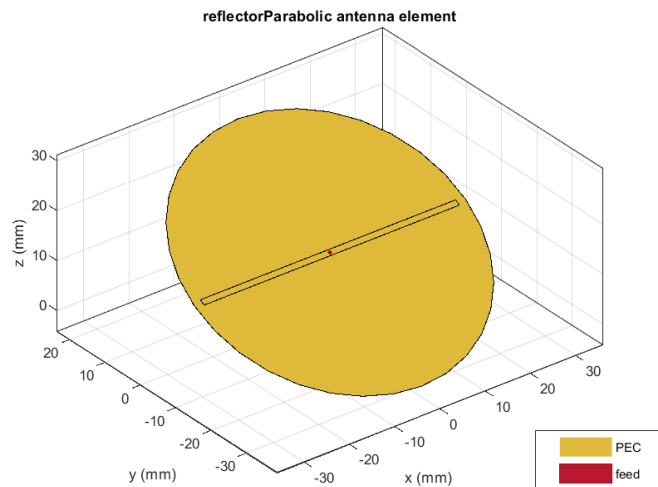
The results is shown below -

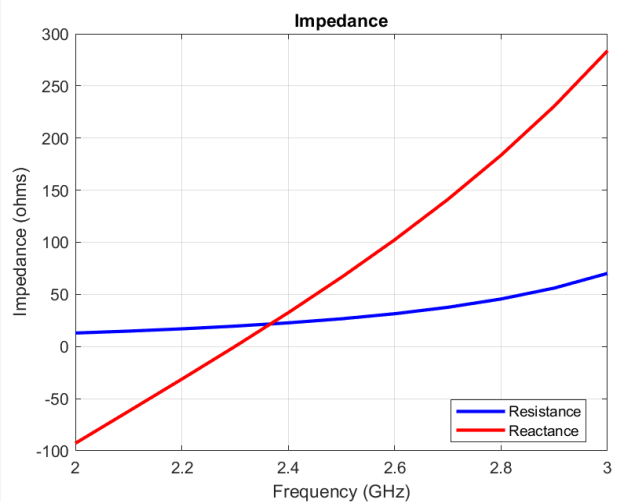
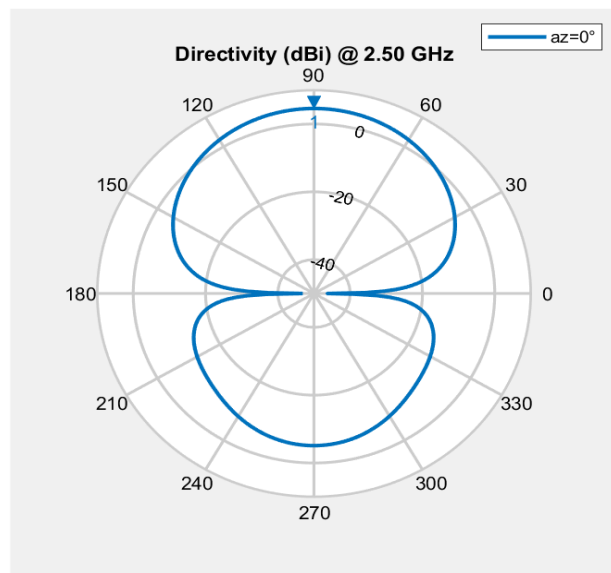
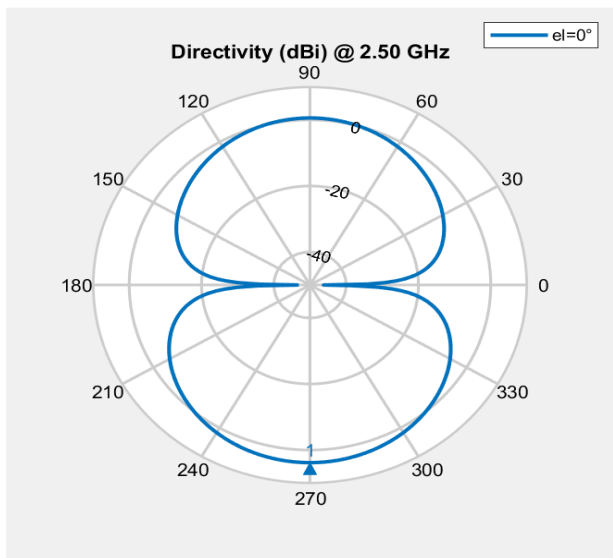
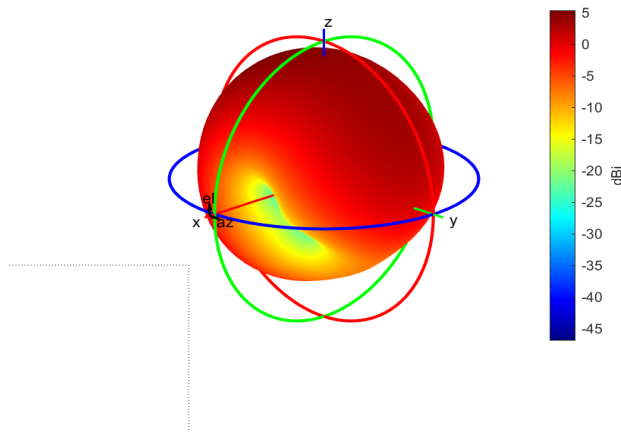
1. F= 2.5 GHz

Efficiency = 0.25

Beam Width =140.0981

Gain(dB) = -2.1043





2. $F = 7.5$ GHz
Efficiency = 0.25
Beam Width = 46.6994
Gain(dB) = 7.4381

