# Results

## 2D vs 3D results comparison

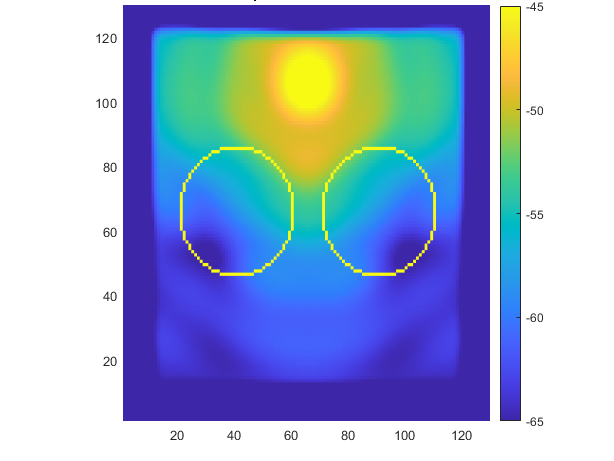
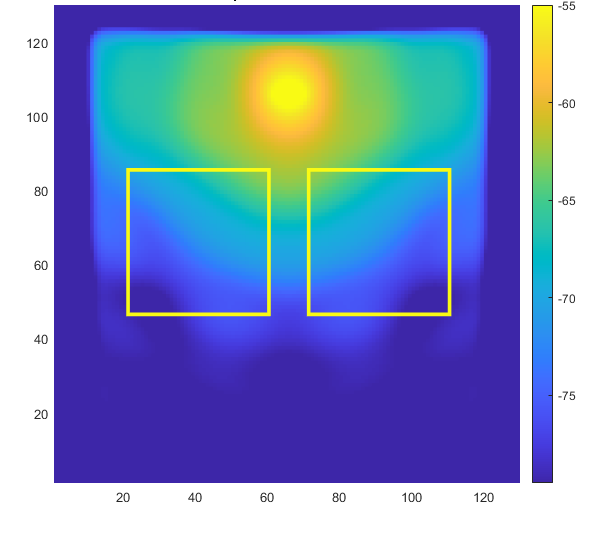
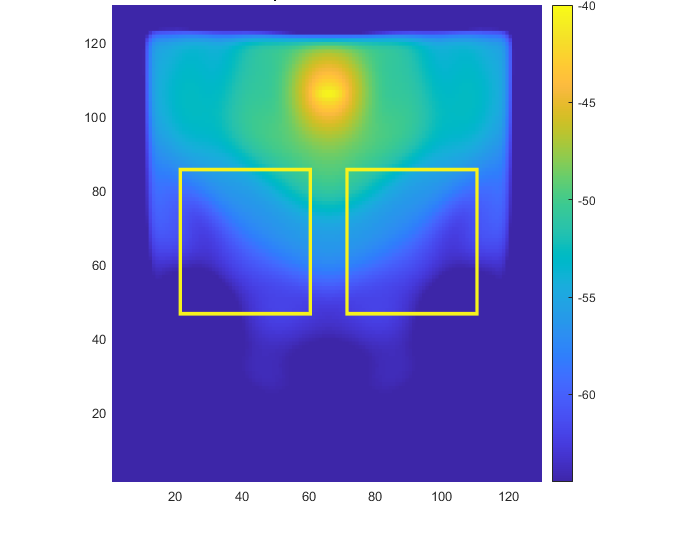
  


Figure 1 2D vs 3D simulation

From the above scalar field strength, we can see that even though the geometry is changed from 2 dimensional to 3 dimensional, the resulting EM field distribution remain unchanged roughly the same. This proves that the 2D simulation is a valid approximation for 3D simulation in this special case of EM field distribution.

## Resolution

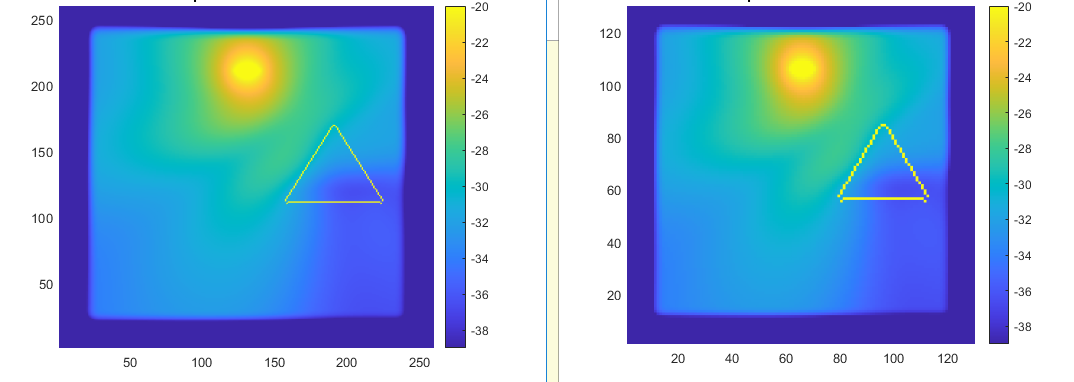
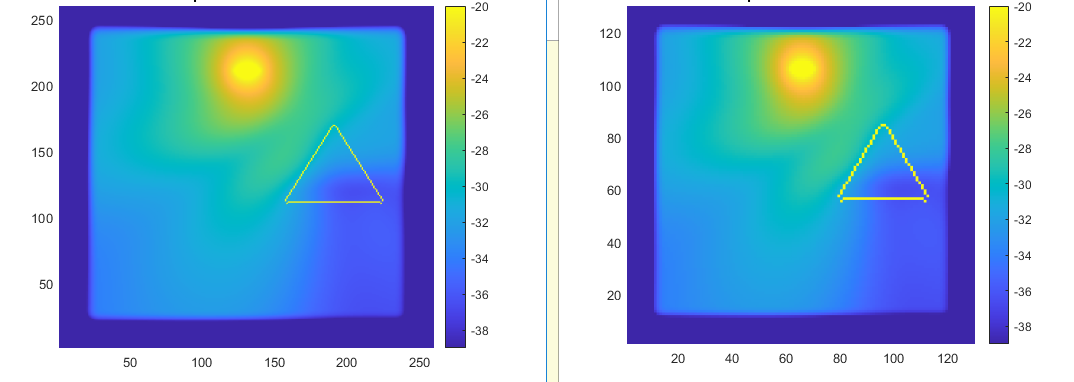
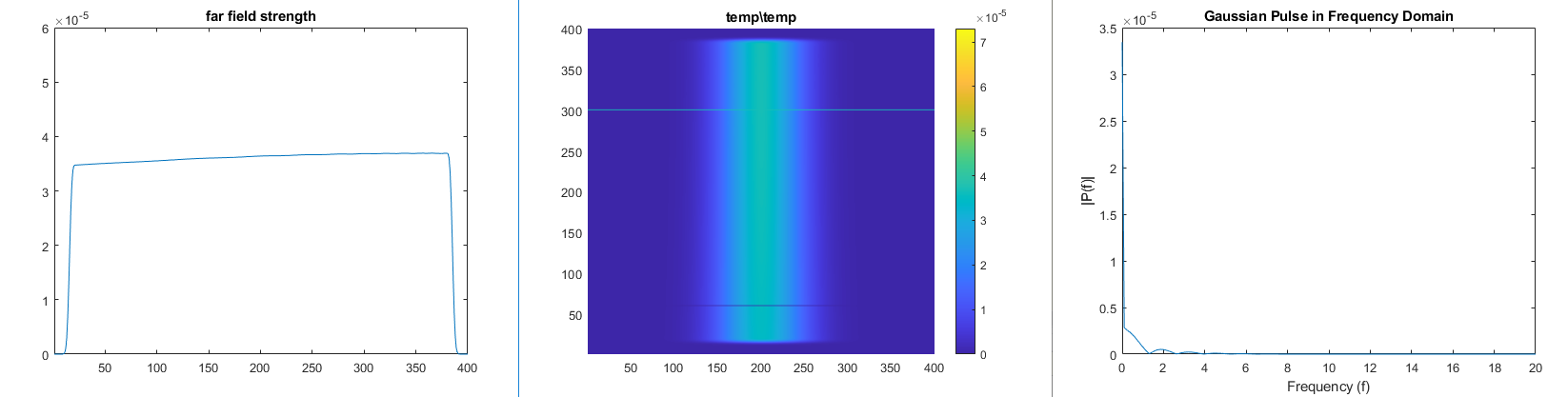


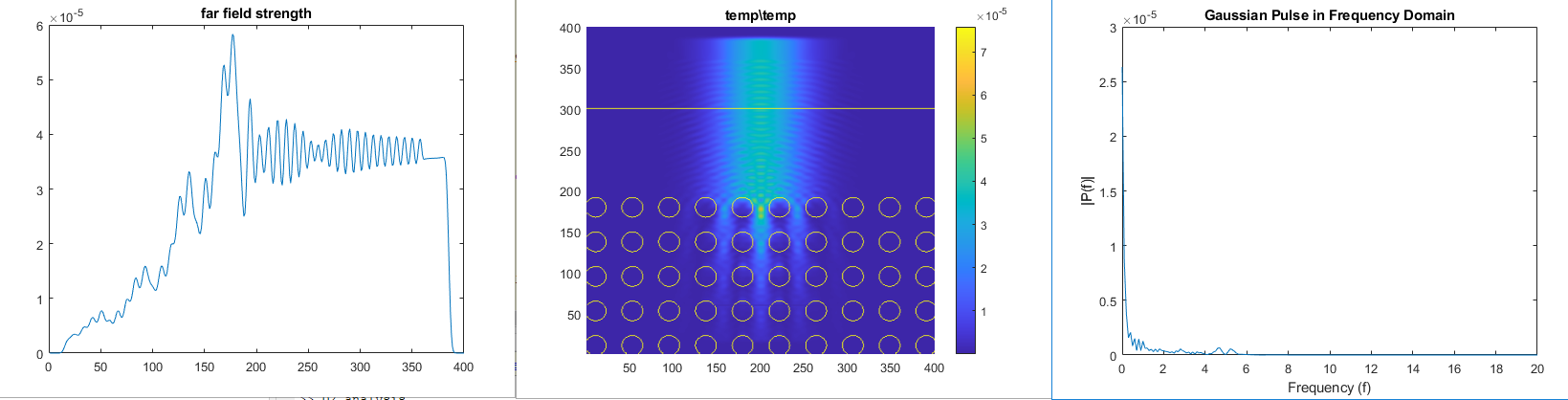
Figure 2 different resolution effect on the results

From the above figure, we can see that even though we reduced the resolution from 30 cells/unit to 15 cells/unit, it produces same EM field distribution. From this, we can conclude that the 15 cells/unit resolution is sufficient to produce accurate results.

Simulation resolution setup:

The frequency of the wave and slice of time data taken play an important balance for the accuracy of the output EM field strength. As the complex shape of the geometry transform the wave non-linearly.





## Incident & reflective spectrum

Computing reflection spectra requires some care because we need to separate the incident and reflected fields. Firstly, save the Fourier-transformed fields from the noermalization run. Then latter subtracts the indident fields from the scattered fields.

Second time, we need to reset meep and and redefine geometry and structure.

Different interface roughness will contribute to different amount of absorbed, reflected field.

## Simple geometry results (3D modelling)

## Shape

### Square

### Circle

### Triangle

## Size

### Relative to wavelength

### Critical size formula

## Spacing or channel for light

### Relative to wavelength

## Filling factor

## Anisotropic inhomogeneous dielectric constant