Wavenology Tutorial Parametric Analysis

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Introduction

User can use parametric sweeping to decide the geometries dimensions to obtain a desired performance.

For example, there is a patch antenna with designed working freq. at 15.0 GHz. The width and length are expected around 12 mm and 15 mm, respectively.

Here, we will use parametric sweeping to tune the size of patch to obtain a best radiation performance.
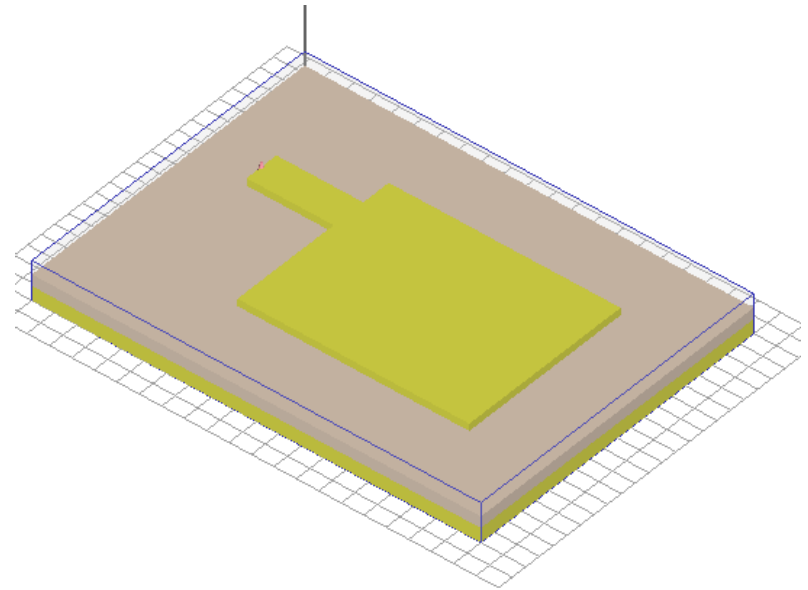
1. Design the patch dimensions
by **variables**.
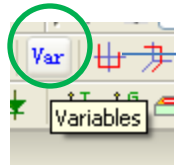
Define variables:

x1=5

y1=10

dx=12.45

dy=16

2. Define patch dimension by variables.
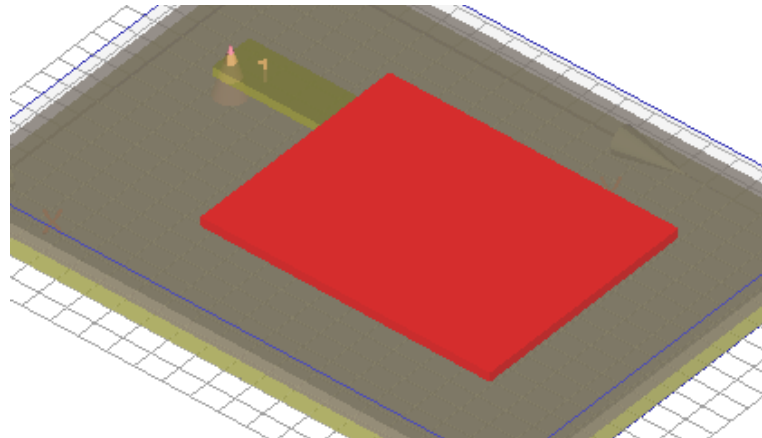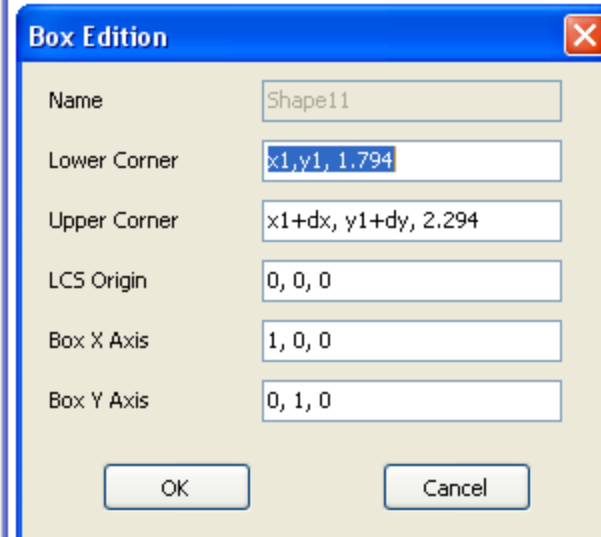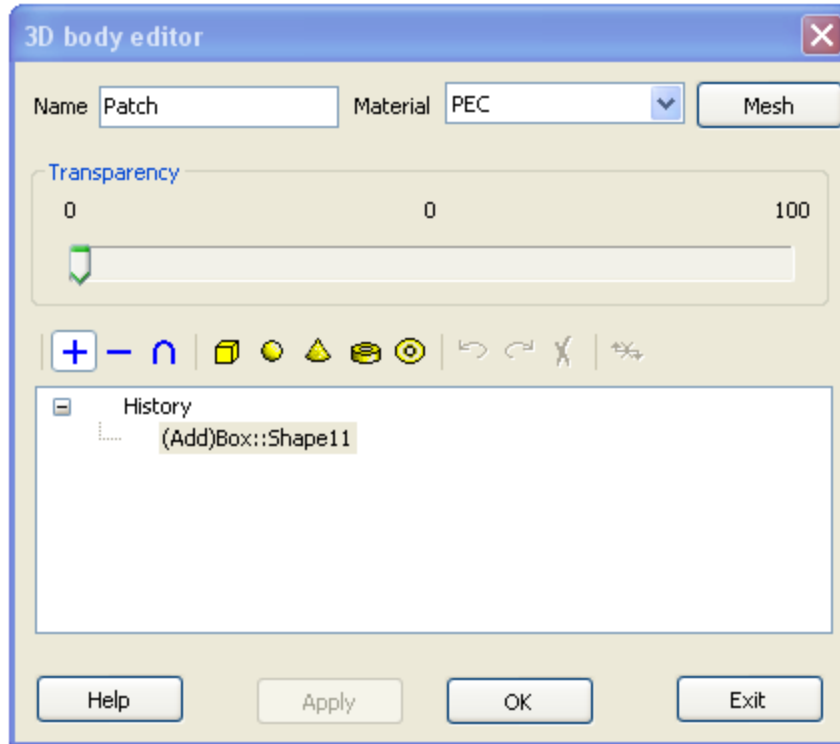
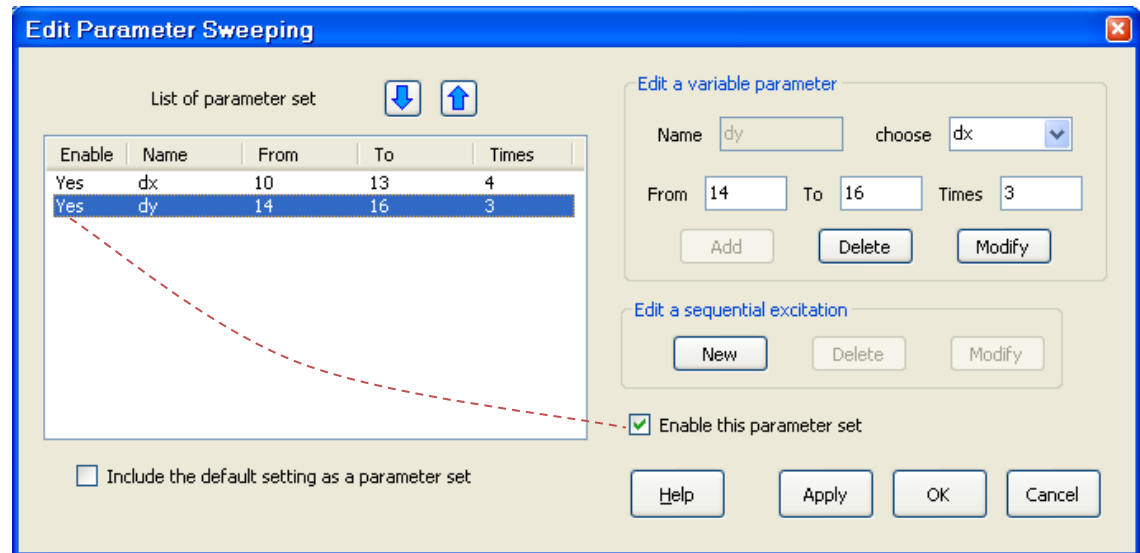## 3. Define how to sweep
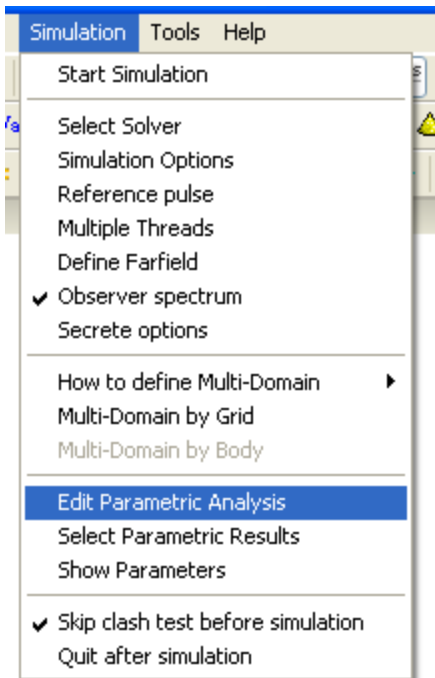
Use "**Edit Parametric Analysis**" to define which parameters will be swept.

Options:
- ☐ Enable this parameter set
  → Enable or Disable the parameter when parametric analysis.
- ☐ Include the default setting as a parameter set
  → Add the default parameter set to the last parameter set.
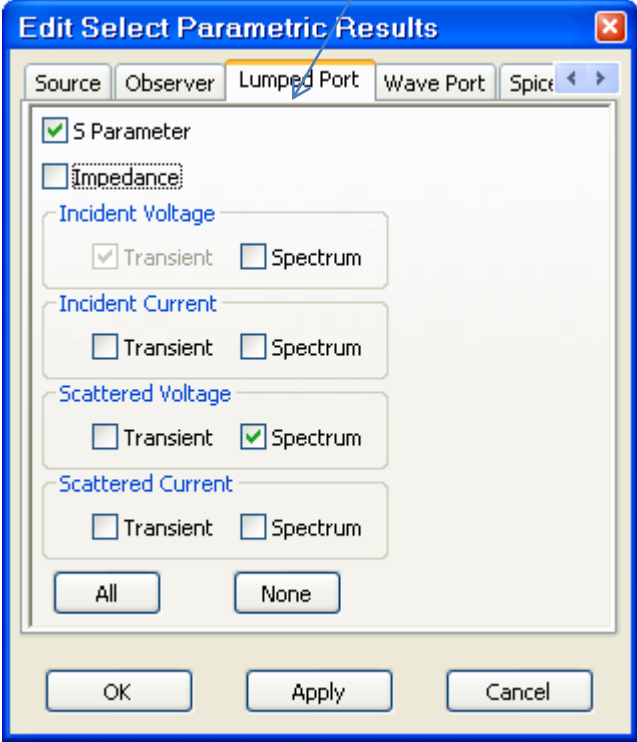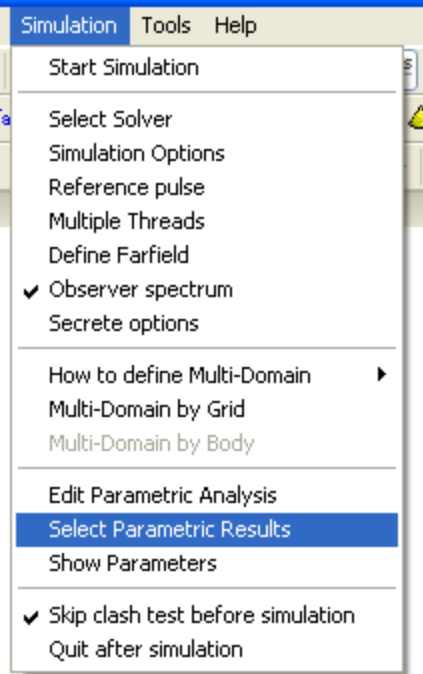

Here, we want to sweep:
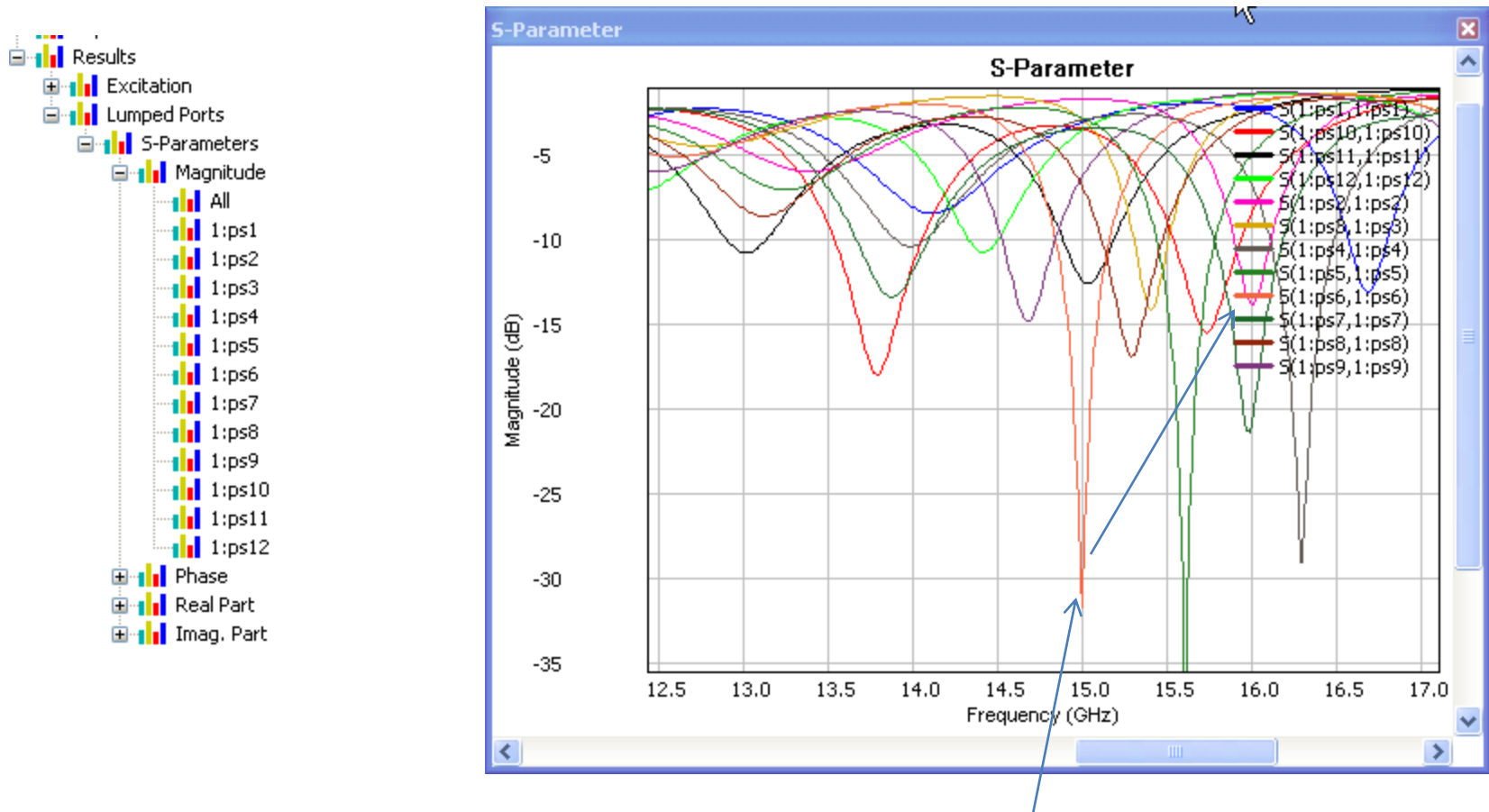dx from 10 to 13 with 4 steps, means dx=10, 11, 12 and 13, respectively.
dy from 14 to 16 with 3 steps, means dy=14, 15 and 16, respectively.

4. User need to let system record S11 for the antenna in the sweeping.

Switch to **Lumped port** page and check "**S parameter**". (In this case, we use lumped port as the excitation and record S11)
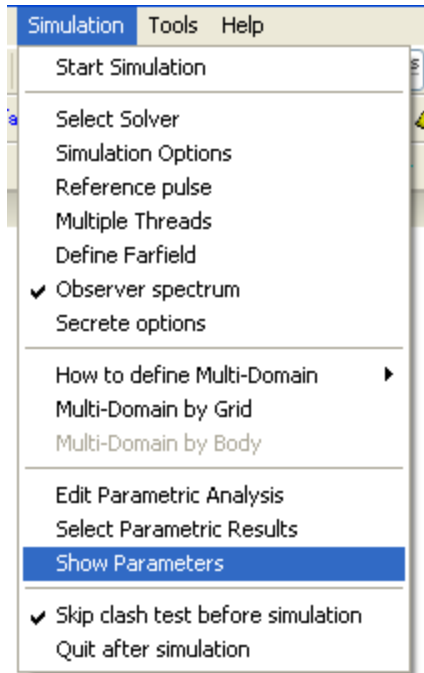
5. run sweeping and get results

It can be seen that **S11 ps6** has the best performance at 15.0 GHz

6. Check the corresponding dx and dy values for **SP6**.

Press "**Show Parameters**" menu

It can be seen that **S11 ps6** has dx=11 and dy=16, respectively.

Therefore, we can fix the patch with width as 11 mm and length as 16 mm to obtain the best radiation performance at 15.0 GHz.