

## Test case 1: array antenna RCS

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### Geometry

#### Unit cell

A coaxial waveguide ends up on a ground plane; the inner conductor is extended above the ground plane.

Characteristics of the coaxial waveguide:

- Diameter of the inner conductor : 7 mm
- Diameter of the outer conductor: 20 mm
- Position of the wave port: 100 mm under the ground plane
- Dielectric insulator:  $\epsilon_s=2.2$ ,  $\mu=1$

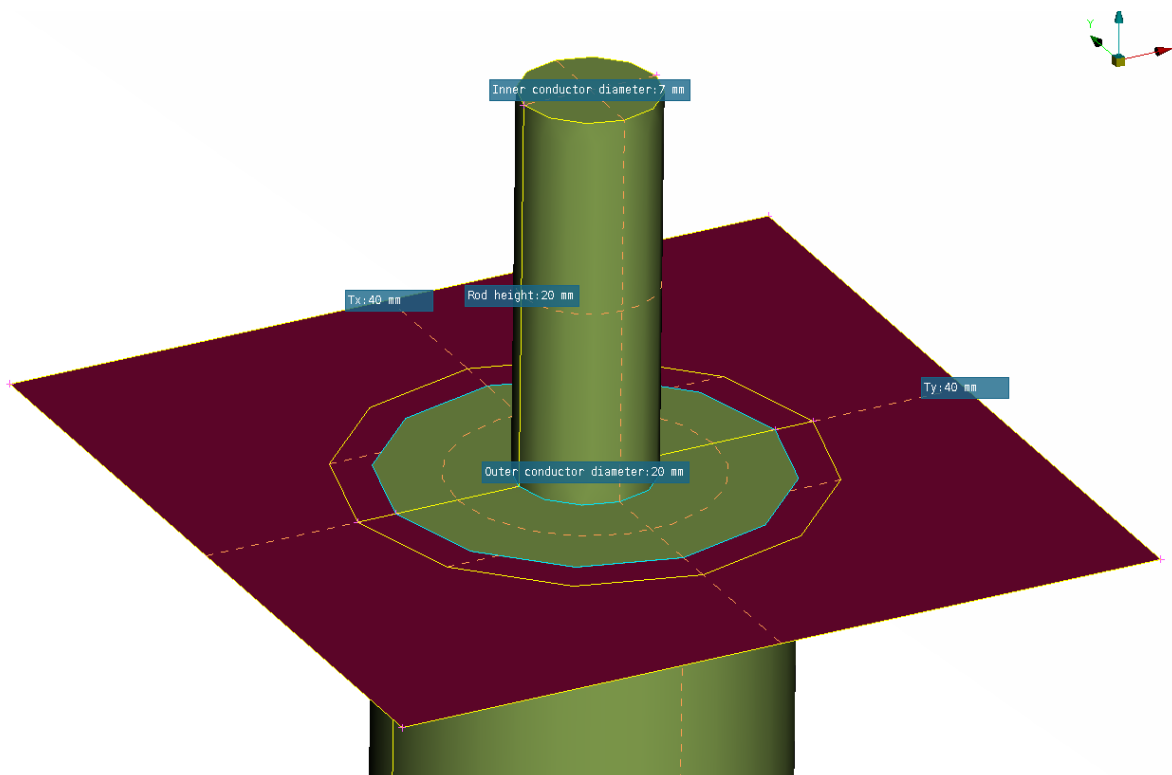


Figure 1: MONOPOLE UNIT CELL

#### Array

The monopole unit cell is repeated 20 times along the X direction and twice along the Y direction. The ground plane is finite and closed by a 100mm-high perfectly conducting block.

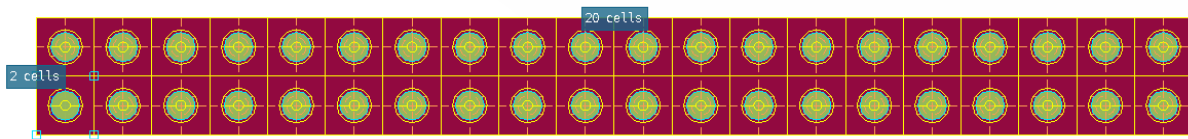


Figure 2: array made up of 20x2 unit cells

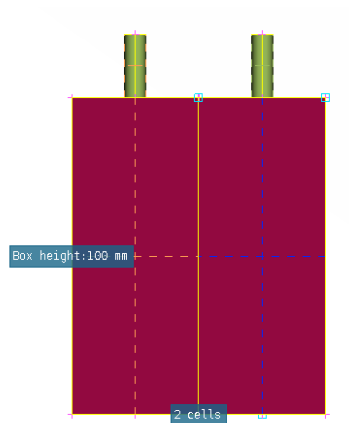


Figure 3: side view

## Test case setup

### Frequency

3.9 GHz

### Incident plane waves

4 incident plane waves: 2 angles and 2 polarisations

$\phi=0^\circ$  (plane xOz) and  $\theta=30^\circ$  or  $70^\circ$

$\phi$  polarisation: **E** along y

$\theta$  polarisation: **H** along y

NB:  $(\theta, \phi)$  are taken according to the [common ISO definition](#) ; the time harmonic convention is  $e^{-j\omega t}$ .

### Wave ports configurations

3 sub test cases :

- a) wave ports on matched loads
- b) wave ports on short circuit
- c) wave ports on loads varying along the x axis (the law is given in a separate ASCII file)

## Results

Bistatic RCS for  $\theta'=[-90^\circ,90^\circ]$  (by  $1^\circ$ ) for each sub test cases a) b) and c) and 4 incident plane waves

3 ASCII files (for each sub test case) with 17 columns (angles in radian)

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## Input file

CAD: monopole\_20x2.step

Loads for sub test case c: varying\_load.txt