

WORKSHOP EM ISAE 2010
TEST CASE 6
Cylinder with cavity

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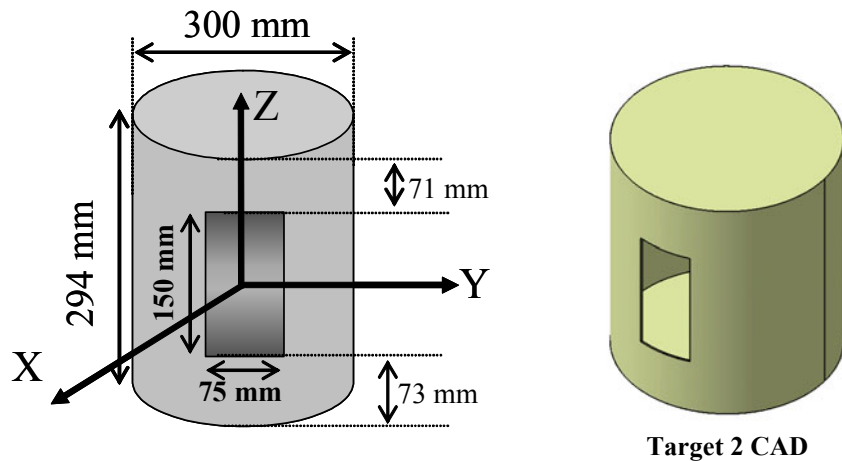
This test case considers a cavity filled with air and shaped in a perfectly electrical conducting cylinder (the geometry is the same than the geometry of the EM ISAE Workshop 2008, test case 2, target 2).

The requested results are the Monostatic Radar Cross Section of the target from frequencies 5 GHz to 18 GHz, with a step of 0,1 GHz and the parallel component of the field at the centre of the cylinder.

The RCS measurements results (from CELAR anechoic chamber) will be available.

1. Definition of the geometry

The target is a hollow cylinder, air filled, with a rectangular aperture. The phase centre is the origin of the coordinate system. The cylinder axis is Z. The X axis is normal to the cavity aperture.



The thickness of the vertical wall is equal to 2.5mm.

The thickness of the horizontal (top and bottom) walls is equal to 2mm.

The cylinder dimensions are:

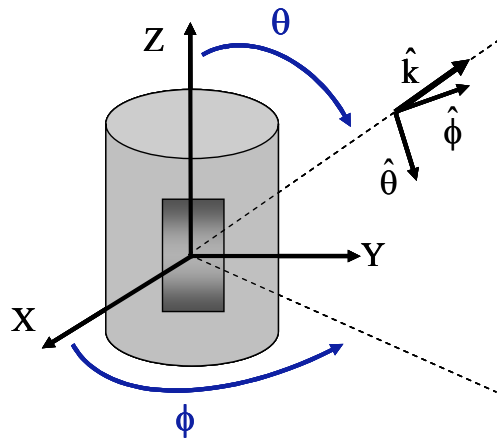
- Length 294mm
- Diameter 300mm

The aperture dimensions are:

- Length 150mm, centred on Z=1mm
- Width 75mm

2. Output results and formats

- Case 1: Monostatic RCS:
 - Frequencies from 5 GHz to 18 GHz, with a step of 0,1 GHz
 - Incidence angles: $\theta = 90^\circ$, $\phi = 0^\circ$
 - Polarizations: $\phi\phi$ et $\theta\theta$ (HH and VV)
- Case 2: Parallel component of the electric field at the centre of the cylinder, normalized by the direct incident electric field
 - Frequencies from 5 GHz to 18 GHz, with a step of 0,1 GHz
 - Incidence angles: $\theta = 90^\circ$, $\phi = 0^\circ$
 - Polarisation: $\phi\phi$ (HH)



$\phi\phi$: co-polarisation with incident electric field parallel to $\hat{\phi}$
 $\theta\theta$: co-polarisation with incident electric field parallel to $\hat{\theta}$

- **Result formats**

Case 1 :

The results will be supplied in ASCII files with 4 columns: Frequencies (GHz), RCS (dBsqm) and complex electric field (a,b) with a real part and b imaginary part

Case 2 :

The results will be supplied in ASCII files with 3 columns: Frequencies (GHz), Modulus and Phase (degree)