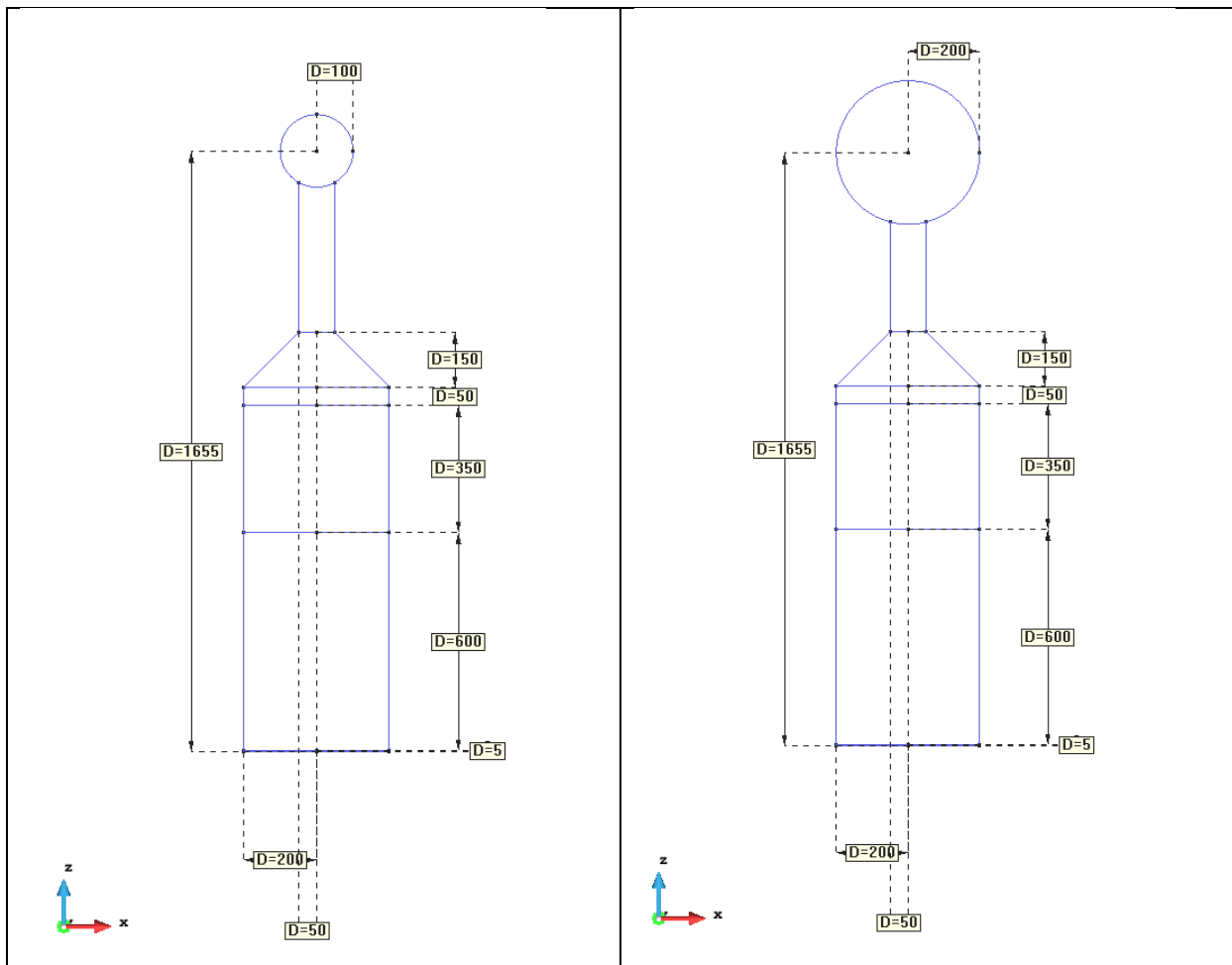


# RCS for a PEC sphere on a polystyrene support.

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## 1 Definition of the geometry

This test case concerns the RCS computation of TWO perfectly conducting spheres on a polystyrene column. Units are mm. For the 2 spheres ( $R_1=100$  mm,  $R_2= 200$ mm) their center are at 1655mm. **The geometry is purely axisymmetrical.**



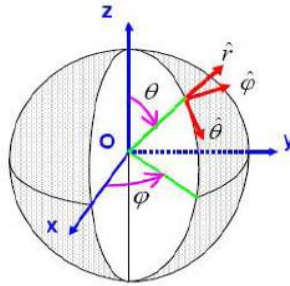
From bottom to top:

	Radius(mm)	Height(mm)	material
plate	200	5	pec
T1	200	600	$\epsilon = 1.20, \mu = 1.0$
T2	200	350	$\epsilon = 1.12, \mu = 1.0$
T3	200	50	$\epsilon = 1.08, \mu = 1.0$
T4	200 & 50	150	$\epsilon = 1.20, \mu = 1.0$
T5	50	Depend to the sphere $H + R_{\text{sphere}} = 500$	$\epsilon = 1.20, \mu = 1.0$

## 2 Simulation Parameters

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The time dependency is assumed to be  $\exp(j\omega t)$ .



For the target described above, the monostatic RCS shall be simulated:

- for the frequency range 8 to 12.0 GHz with  $\delta f = 10$  MHz (i.e. 401 frequencies),
- for  $\phi=0$
- for  $\theta=90^\circ$ ,
- for both polarizations ( $\theta\theta$ -polarization and  $\phi\phi$ -polarization).

### 2.1 Computation

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For each sphere, we expect two computations:

1. Sphere and support
2. Only the support

### 2.2 Data Formats

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The results shall be stored in four ASCII file and shall contain:

$f$ ,  $\text{Real}(E_{\theta\theta})$ ,  $\text{Imag}(E_{\theta\theta})$ ,  $\text{Real}(E_{\phi\phi})$ ,  $\text{Imag}(E_{\phi\phi})$

Where :

- $f$  is the frequency in GHz,
- $\text{Real}(E_{\theta\theta})$ ,  $\text{Imag}(E_{\theta\theta})$ ,  $\text{Real}(E_{\phi\phi})$ ,  $\text{Imag}(E_{\phi\phi})$  are the real and imaginary parts of the scattered field strengths in  $\theta\theta$ -polarization and  $\phi\phi$ -polarization.
- $E$  is the backward scattering :  $\frac{E^d}{E^i}$

### 2.3 Others

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Participants must provide, in addition to the result files, a document containing at least:

- Method used (with pertinent parameters),
- Number of degrees of freedom,
- Total computation time,
- Number and type of processors.