# TEST CASE 2 : EBG material

## Transmission through an Electromagnetic Band Gap Material

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**Abstract :**

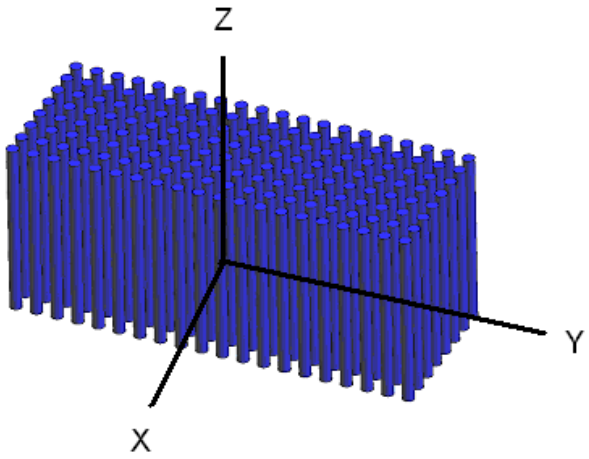
This test concerns the simulation of the field diffracted by an 8x20 EBG array constituted by alumina dielectric rods.

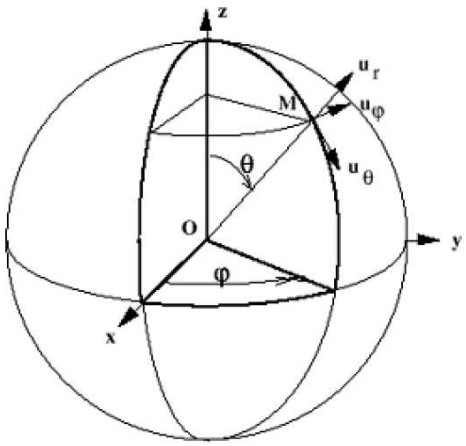
**Geometrical file under the IGES format is available.**

### *1. Definition of the Geometry*

The target is an array of cylindrical dielectric rods. The array is centred at the origin (0,0,0). All the dimensions are given in millimetre (mm).

| | |
|---|---|
| Rods diameter (mm) | 4 |
| Rod length (mm) | 60 |
| Array step (mm) | 7 |
| Alumina permittivity | $\varepsilon_r = 9.4$ |




### *2. Simulation Parameters*

The array is excited by a uniform and unitary plane wave ((|Ei|=1), whose electric field is polarized parallel to the axis OZ of the rods and whose incidence direction is collinear to the OX axis ($\theta = 90, \varphi = 0$).The parameters to be simulated are the Total Electric field transmitted behind the array at points (-28 mm,0,0) and (-35 mm,0,0).

The frequency band is 8-16 GHz with a step of 500 MHz (17 frequencies).

### *3. Data formats*

The results will be stored in 2 separated ASCII file containing on each row the data:

a) near field at (-28 mm,0,0) : f, 20Log10(|E|), 20Log10(|Ex|),20Log10(|Ey|),20Log10(|Ez|)
b) near field at (-35 mm,0,0) : f, 20Log10(|E|), 20Log10(|Ex|),20Log10(|Ey|),20Log10(|Ez|)

where f is the frequency in GHz, and E is **the total electric field**.