MetaSurface CrossRoll

This structure is realized with a layer of copper (17 µm thickness) over a dielectric substrate (Epsilon1 = 4.1, Tg = 15 e-03, mu=1,0) of thickness 0.3 mm. A 0.2 mm gap of air separates this substrate from a metalic ground plane located at z=0.

The unit pattern is defined below. The prototype is composed of a grid of 10 x 10 unit patterns. Its dimension is 296 x 296 mm.

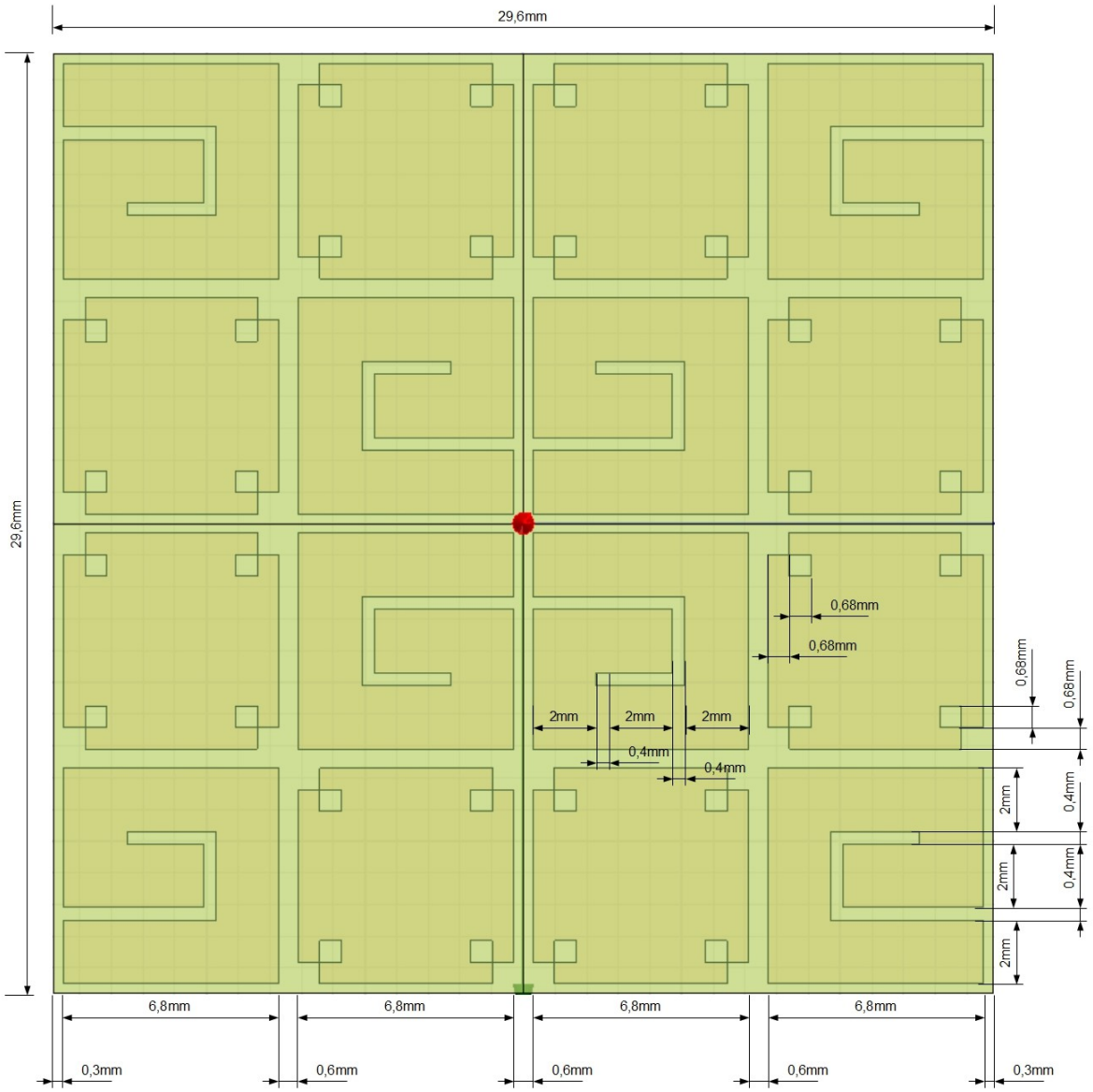
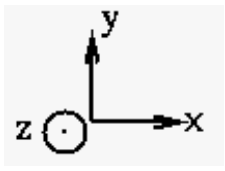


Illustration 1: The unit pattern of the MetaSurface CrossRoll



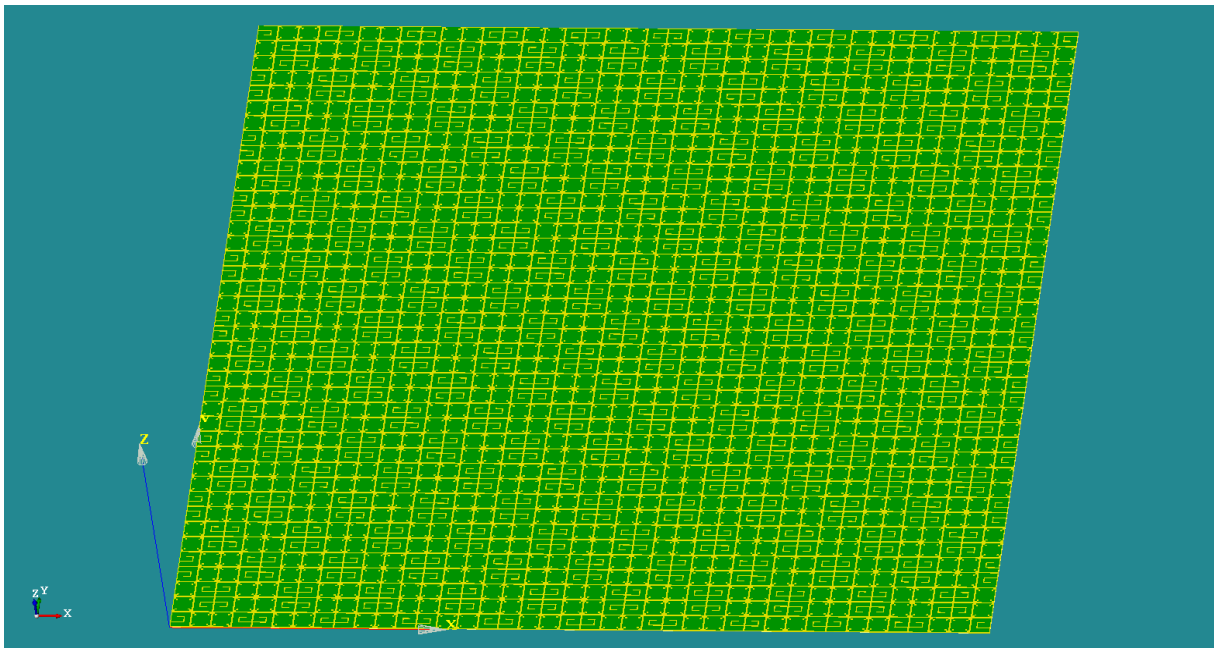


Illustration 2: The entire MetaSurface CrossRoll object (green=copper metallization, yellow=dielectric)

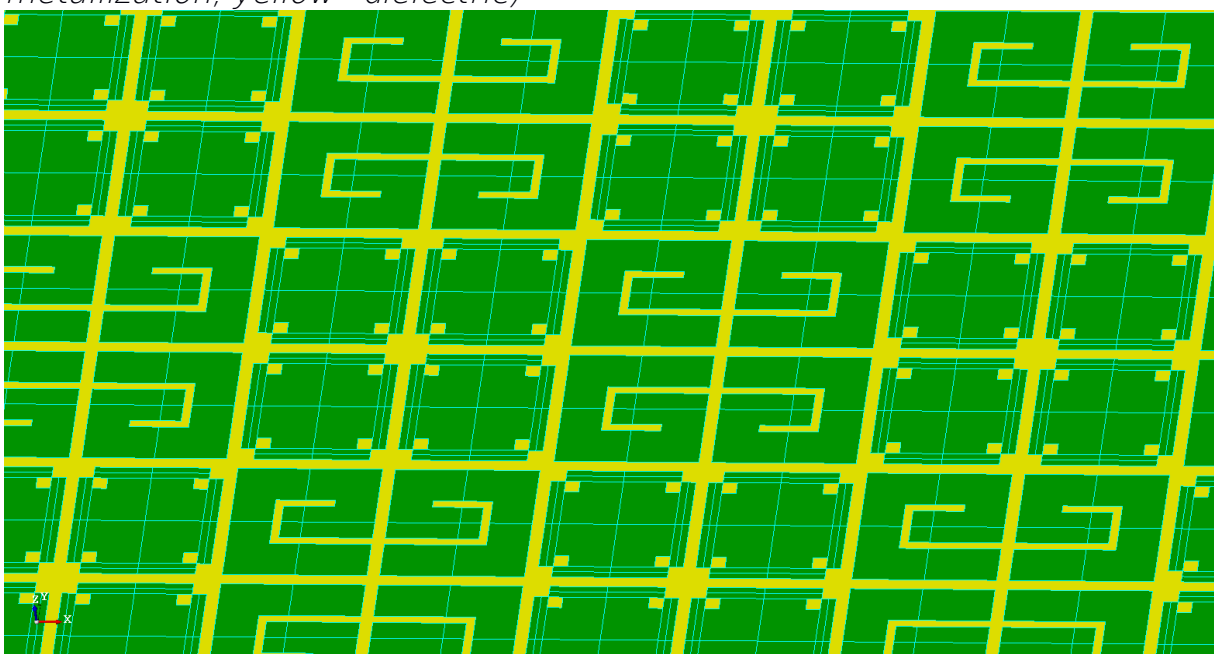


Illustration 3: Zoom on the MetaSurface CrossRoll object (green=copper metallization, yellow=dielectric)

Parameters of the computation :

- Frequency from 6 GHz to 18 GHz with a step of 0.1 GHz
- Monostatic RCS with normal incidence ($\theta=\varphi=0$) for both polarization theta-theta et phi-phi (E field colinear to u_θ resp. u_φ). RCS is defined as :

$$10.\log_{10}(|E_{diff}|/|E_{inc}|)$$

The object has been simulated with HFSS 14 and CST Microstripes, and measured at EADS and IEF. The CAD File (with zero thickness metallization) is available on the Workshop website or on demand (guillaume.sylvand@eads.net). The python script for salome 6.3 is also available.

Result :

One result file, in ASCII format, should be produced, with 3 columns :

frequency RCS_θθ RCS_φφ

Frequency should be in Hz, RCS in dB.

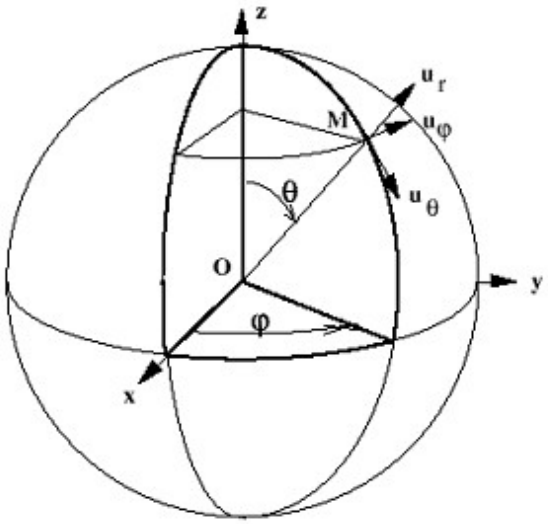


Illustration 4: Angle definition