

## Photonic Rectangular Slot Resonator with Four Dielectrics Layers

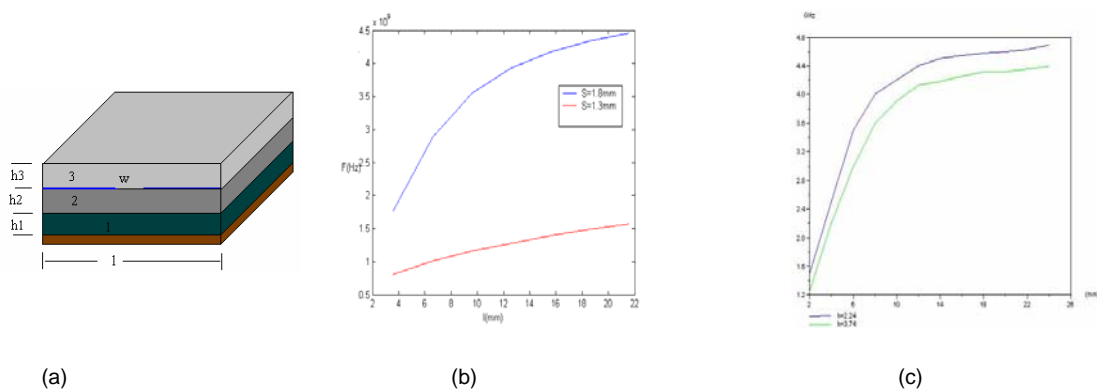
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**Abstract** – This work shows the development and mathematic analysis, of the photonic rectangular slot line resonator, with four dielectrics layers, using the concise full wave Transversal Transmission Line, TTL-method. Starting from Maxwell's equations a set of equations that represents the electromagnetic fields are obtained. The complex resonant frequency is then calculated numerically. New numerical results are shown graphically.

The rectangular slot line resonator with four layers consists of one rectangular slot line resonator, where there are two layers under and two layers over the patch. This structure is show in the Fig. 1.a, with width "w" and length "l". The analysis through the method TTL, with basis function adequate and Garlekin's procedure, are used to obtain the general equations of the electromagnetic fields. The complex resonant frequency is calculated, using double spectral variables, being the same, used in the determination of the efficiency and bandwidth's parameters.

The Fig. 1.b shows the curve of resonant frequency as function of the slot length, for different thickness substrate at the first time. The Fig. 1.c shows the resonant frequency as function of the slot width for different thickness substrate. The frequency increases when the width and the length increase.



**Figure 1:** **a)** Spatial view of the four layers slot line resonator. **b)** Frequency (GHz) as function of the length (mm). **c)** Frequency (GHz) as function of the width (mm).

### References

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