

## ELLIPTIKA is Confident of Filter Design Using Advanced Design System and its Momentum Planar 3D EM Simulator

### Case Study



*"All of our filter studies are presently realized on ADS because we are certain the agreement between the results of electromagnetic simulation and measurements will be very good over a very wide frequency range."*

A. Manchec, PhD, co-founder and technical manager of ELLIPTIKA

*"ADS is today's unique Plug-and-Play EM simulator for the design of planar structures."*

C. Quendo, PhD, engineer for the LEST (Electronics and Telecommunications Systems Laboratory), and co-founder and consultant for ELLIPTIKA

#### CUSTOMER:

ELLIPTIKA, designer of custom microwave filters

#### CHALLENGE:

To develop filters with the best compromise between the highest possible performance, size, sensitivity, and cost

#### SOLUTION:

Advanced Design System with its built-in Momentum planar 3D electromagnetic simulator

#### RESULTS:

- ADS - Momentum ensure 100% specifications matching for high sensitivity designs
- Excellent agreement between simulation and measurement: less than 2% shift (root cause: substrate permittivity dispersion)

### The Company

ELLIPTIKA is a spin-off of the Electronics and Telecommunications Systems Laboratory (LEST-UMR CNRS 6165). The company specializes in the design of microwave passive components – particularly filters. When classical filters and solutions fail to meet given specifications, ELLIPTIKA provides consultation services and tailor-made solutions.

Innovation and competitiveness are a major focus for ELLIPTIKA, whose staff is composed of PhDs specializing in microwave passive systems. ELLIPTIKA also builds on the expertise of the LEST team. Its R&D policy is to follow and anticipate future topological and technological advancements to the benefit of its clients. Its main activities include telecommunications and aerospace and defense applications.



**Agilent Technologies**

## The Challenge

New telecommunication systems require ever increasing performance because the optimal exploitation of spectral resources require constant improvement in filter performance, which necessitates highly accurate CAD tools.

ELLIPTIKA design increasingly high performance microwave filters to satisfy cost and size constraints. ELLIPTIKA meets the needs of customers by developing tailor-made filters with the best compromise between electrical performance (insertion losses, time group delay, flatness, selectivity, rejection, and spurious harmonics), bulk size, sensitivity, and cost.

For more information about ELLIPTIKA, visit [www.elliptika.com](http://www.elliptika.com)

For more information about Agilent EESof EDA and Advanced Design System, visit [www.agilent.com/find/eesof](http://www.agilent.com/find/eesof)

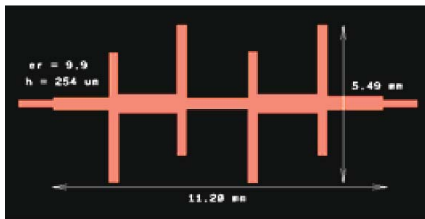


Figure 1. Filter layout on momentum [1]

## The Solution

ELLIPTIKA designers typically start with a planar structure associated with either a microstrip, stripline, or multilayer configuration. They are using Agilent's Advanced Design System (ADS) and its Momentum EM simulator to meet their customers' expectations for even the most difficult and demanding performance specifications.

## The Result

Figure 1 is an example of a planar filter designed using ADS. The substrate was alumina ( $\epsilon_r = 9.9$ ,  $h = 254 \mu\text{m}$ ). Figure 2 shows the results of the Agilent Momentum EM simulation, along with the associated measurement. The result shows good agreement between measurements and EM simulations despite a slight frequency shift caused by dispersion.

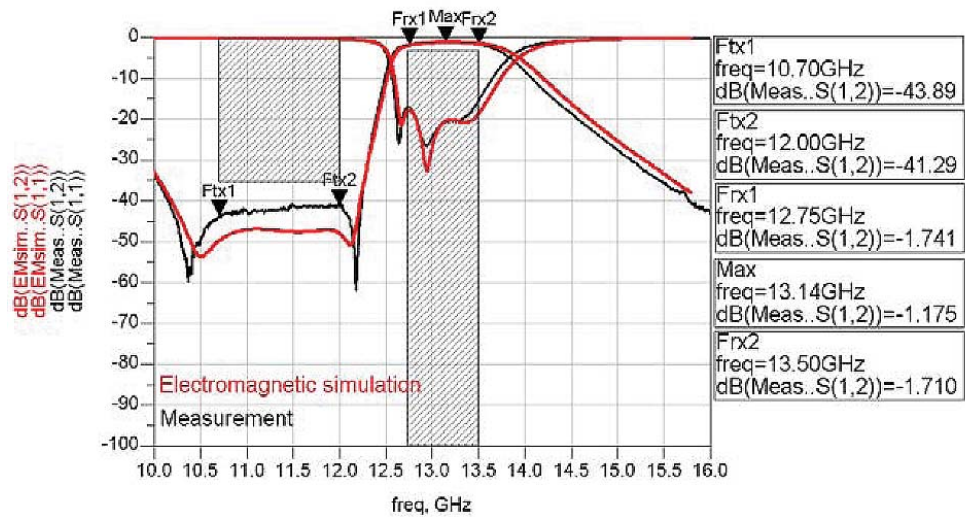


Figure 2. Electromagnetic simulations and measurements [1]

1. "Design of Microstrip Dual Behavior Resonators Filters: A Practical Guide" E. Rius, C. Quendo, A. Manchec, Y. Clavet, C. Person, J. F., Favennec, G. Jarthon, O. Bosch, J. C. Cayrou, P. Moroni, J. L. Cazaux, *Microwave Journal*, December, 2006.

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Printed in USA, April 1, 2009  
5989-9997EN



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