

Collaboration between Academia and Industry:



A Successful Case Study from Colombia

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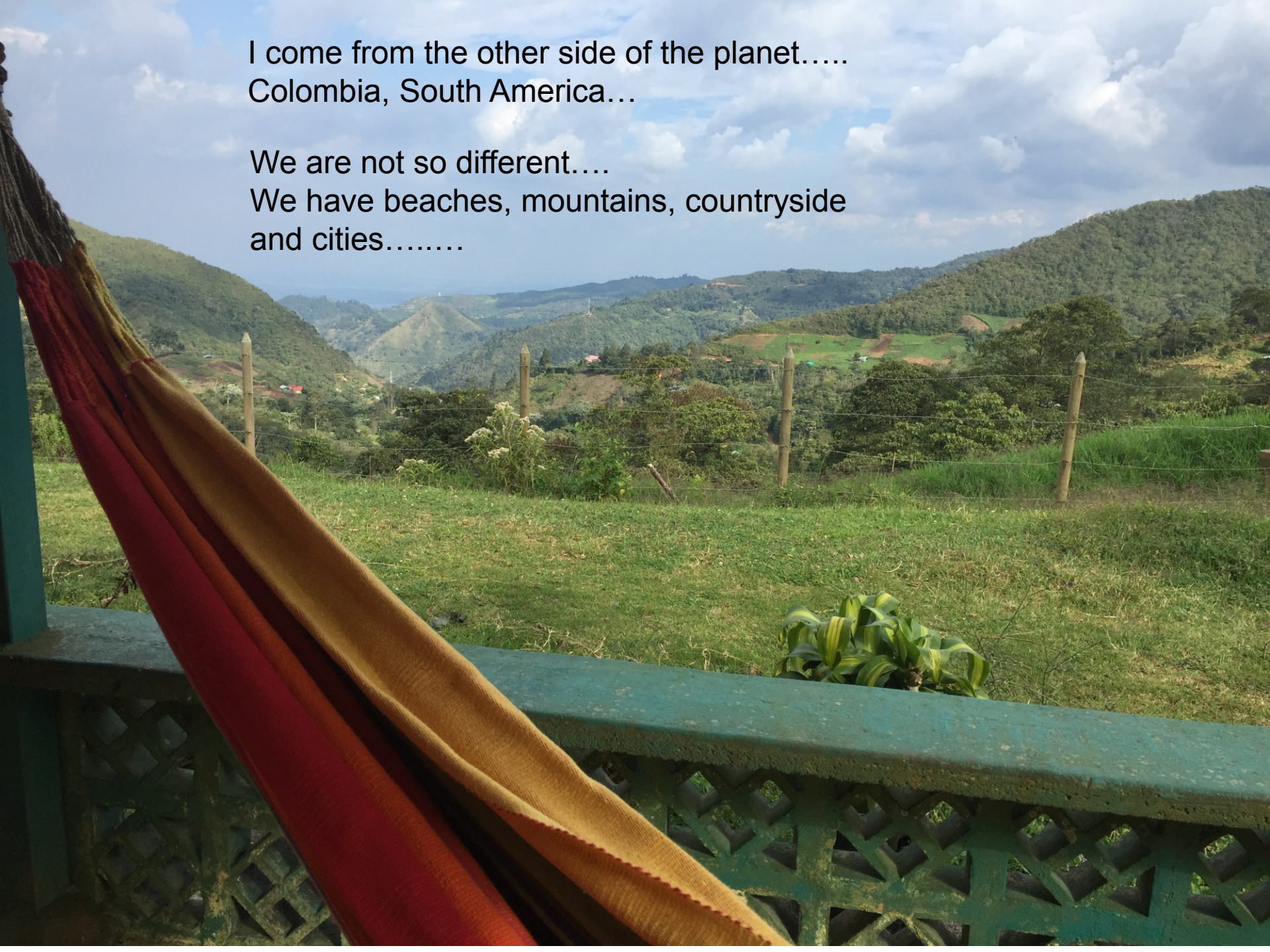
Nairobi, 2016

Outline

- Where we are from and Who we are
- Colciencias' Academia – Industry funding
- The project
- Lessons from this endeavor

I come from the other side of the planet.....
Colombia, South America...

We are not so different....
We have beaches, mountains, countryside
and cities.....



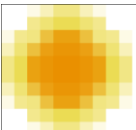
- Cali is the third city in Colombia, and the main city in the southwest.
- Near the pacific coast and Buenaventura, the main port on the pacific side.



Cali



<http://www.colombia.travel/en/where-to-go/pacific/cali>



i2t
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UNIVERSIDAD
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Universidad
Pontificia
Bolivariana



**TES
AMERICA** 5



COLCIENCIAS
Departamento Administrativo de Ciencia, Tecnología e Innovación

Colombia

- 48 million inhabitants
- GDP :0,431 USD Billion
- I+D spent: 0,16% from GDP (2010)
- 15 Researchers. Per 100.000 inhabitants.

THIS PRESENTATION INVOLVES THREE ACTORS



The Industry

TESAmerica



Nairobi, 2016

TESAmerica

- TESAmerica's main objective is to provide strategic support for emerging economies regarding planning, allocating, optimising and controlling the radio spectrum.
- TESAmerica's approach is based on applied research and development for offering services and solutions.
- The company has over 17 years' experience in the field of on-going technological evolution.

TESAmerica

- Two flagship products
 - **TESData**: a spectrum monitoring solution which uses any conventional spectrum analyzer or radio monitor.
 - **TESManagement**: a telecommunications inventory and provisioning solution tool for operators.

The Academia

Icesi and UPB



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The Academia

- Icesi is a Small private university, located in Cali.
 - <http://www.icesi.edu.co>
- UPB is a catholic university, located in Medellín, and one of the oldest in Colombia.
 - <http://www.upb.edu.co>
- Both are between the 20 best Colombian universities.

The Government

Colciencias



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Colciencias Funding program

- Colciencias is the Colombian science and technology authority.
- Through the University - Company funding initiative, Colciencias Fosters the development of Innovative projects between Academia and industry.
- The University develops the Project and transfers the results to the company.



Icesi and TESAmerica

THE STORY OF A LONG TERM RELATION

Icesi and TESAmerica

- A relation of more than 12 years between Andres Navarro (Icesi) and Daniel Rosas (TESAmerica's CEO).
- Collaborating in Small projects and teaching.
- Taking advantage of the Colciencias incentives for Academia and Industry collaboration.

We had a dream ...
and the challenge was to realize it...



SIMONES: FIRST BIG PROJECT

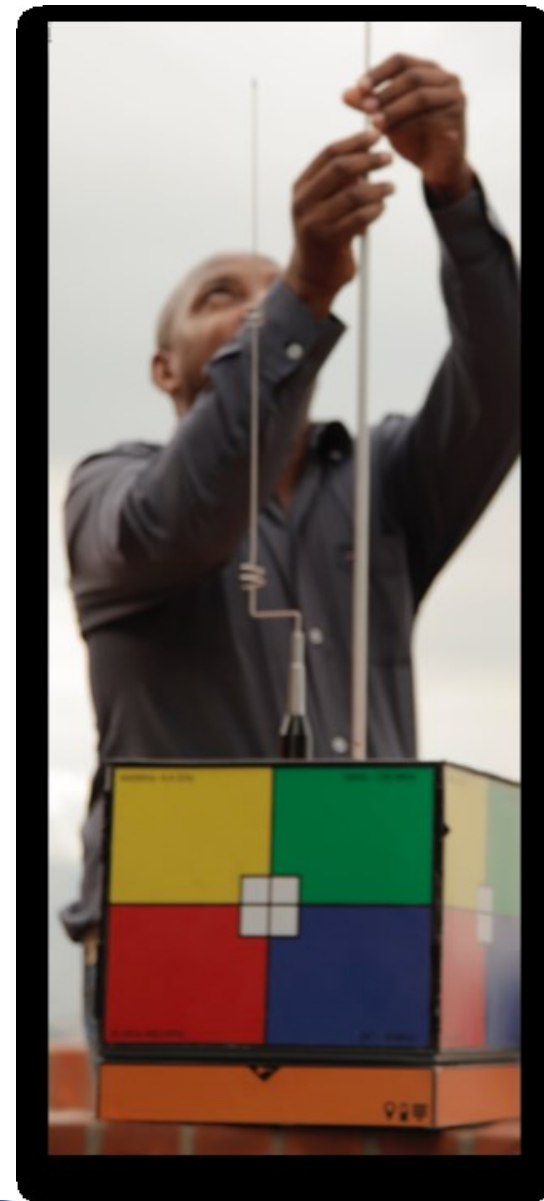
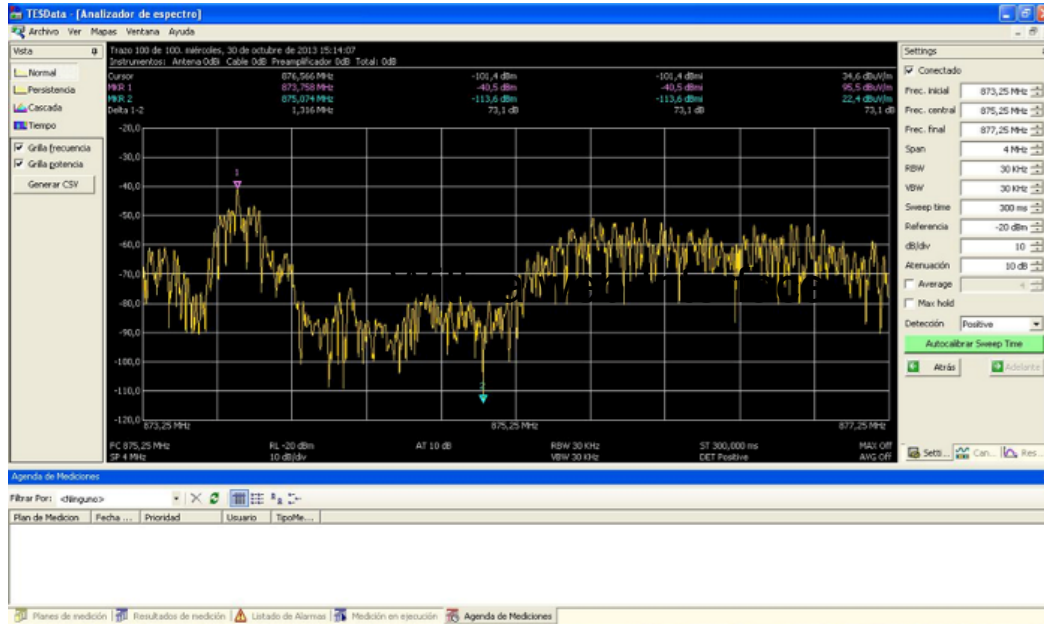
SIMONES

- The main goal of the Project was to develop an affordable spectrum monitoring unit using SDR and Open source software, integrated with TESData, the flagship product of TESAmerica.



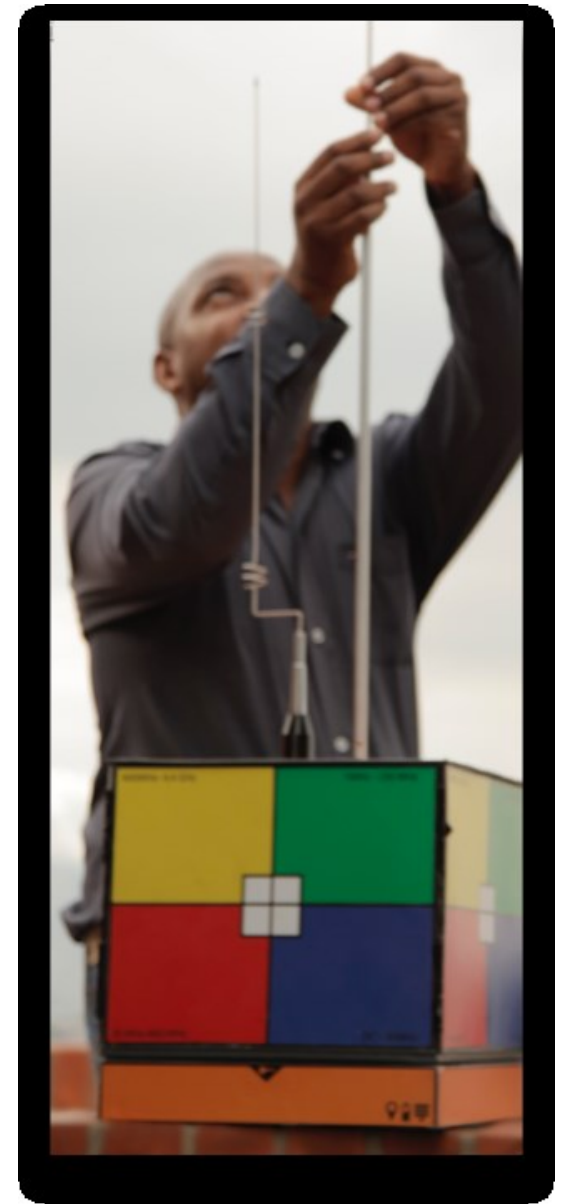
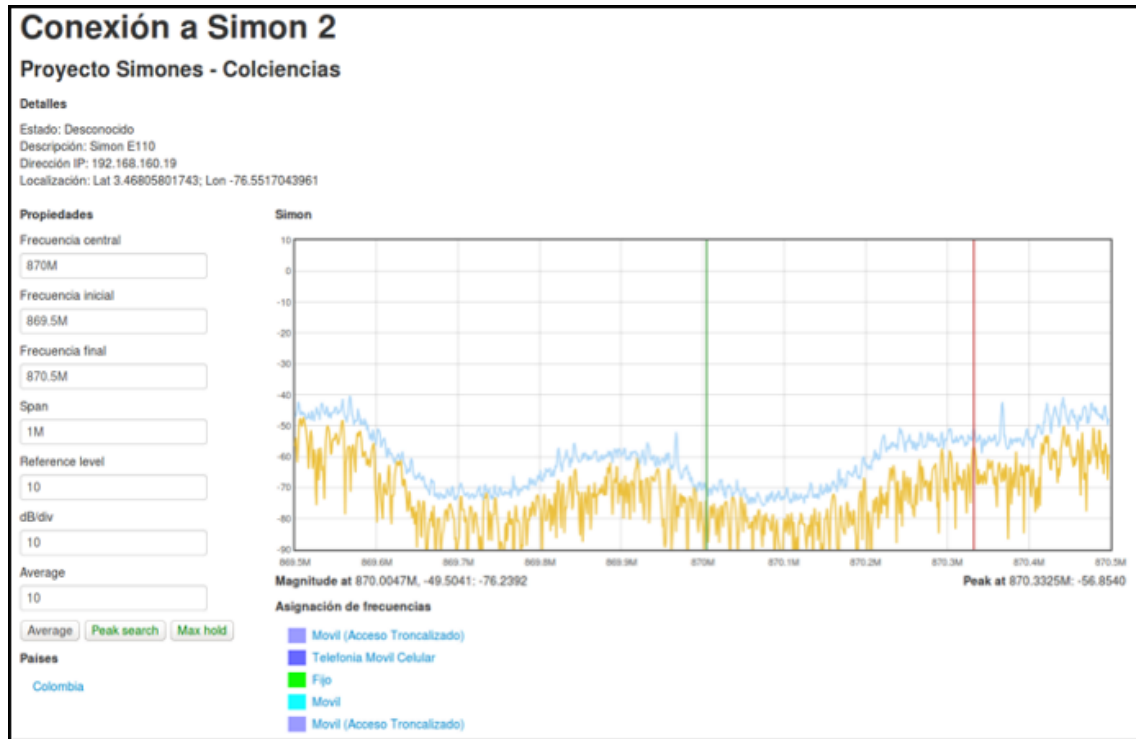
SIMONES

Integrated with TESData



SIMONES

With a web Interface



A big joint venture

SPECTRUM PROGRAM



The Challenge was to develop
an affordable solution to
spectrum management in low
and medium income countries
and complex topography



Spectrum Program

- Two Academia
 - Universidad Icesi
 - Universidad Pontificia Bolivariana (UPB)
- One Industry partner
 - TESAmerica
- Colciencias Grant for three years

Spectrum Program

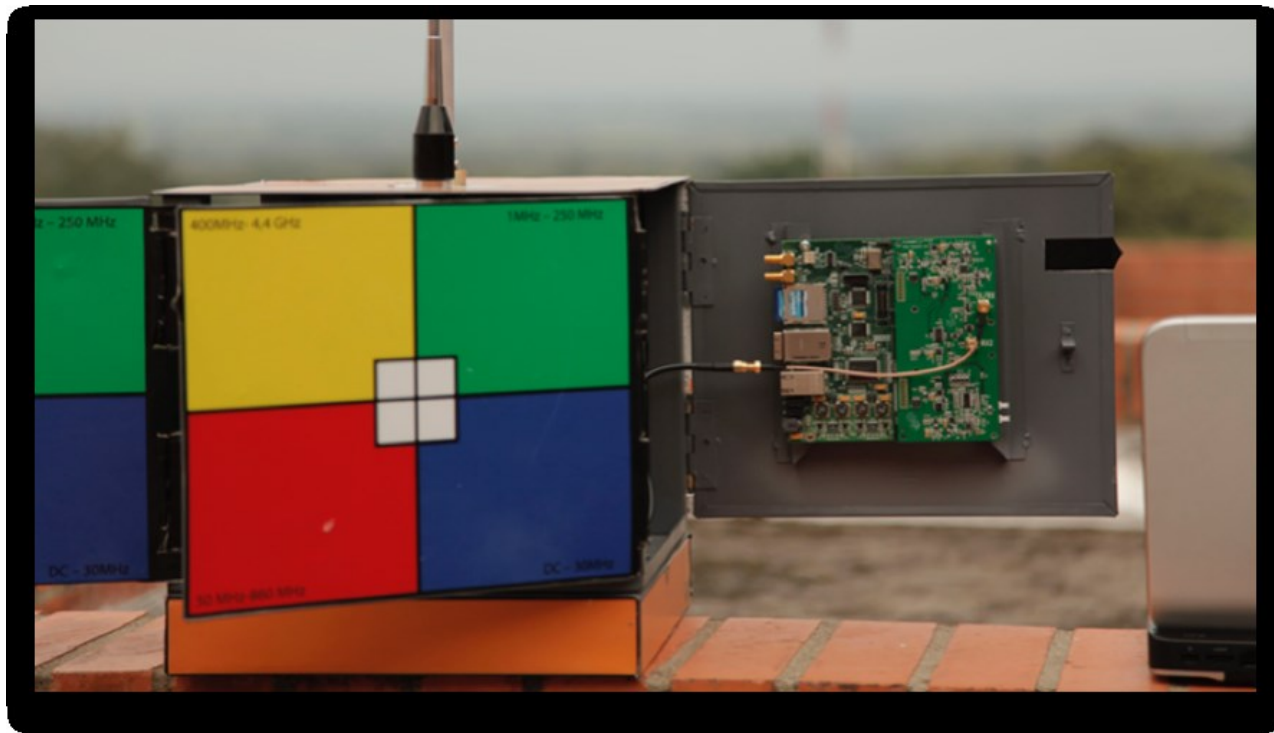
- Main goal involves the development of ITU-R SM.1392 functionalities using SIMON.
 - Bandwidth measurements
 - Frequency Measurements
 - Power Spectral Density
 - Occupancy Measurements
 - Direction Finding

A dramatic sunset or sunrise scene. The sky is filled with large, dark clouds that are illuminated from below by a bright orange and yellow light, creating a strong contrast. The lower part of the image shows a dark, silhouetted landscape with trees and buildings. The overall mood is serene and powerful.

A cloud solution....

Spectrum Program

- Integrated with ITU SMS4DC
- And CelGIS, a radio planning tool developed in Icesi.



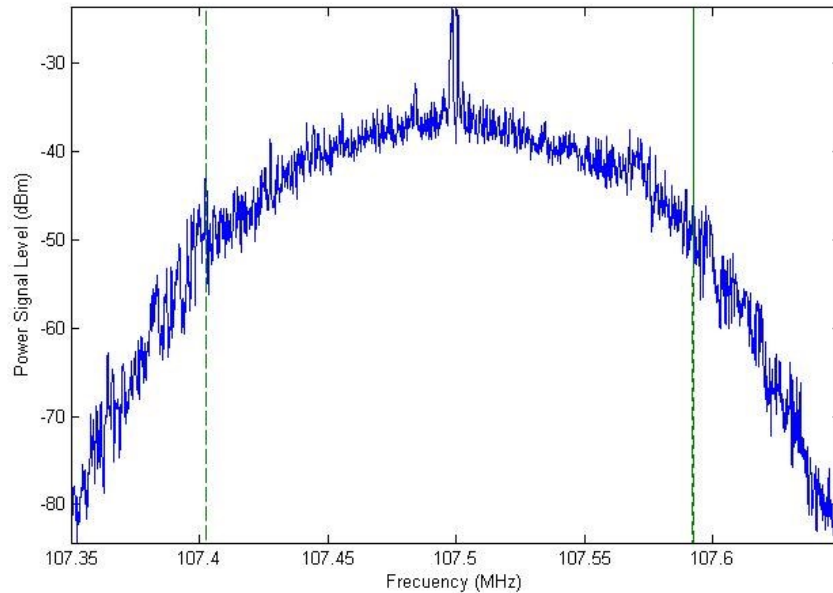
Spectrum Program



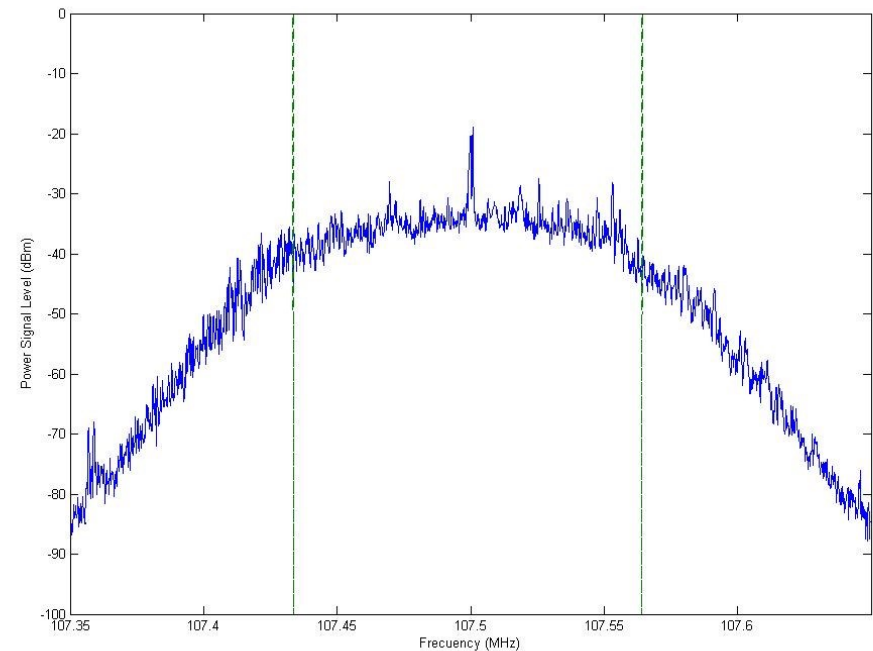
Spectrum Program

Bandwidth measurements

$\beta/2$ method

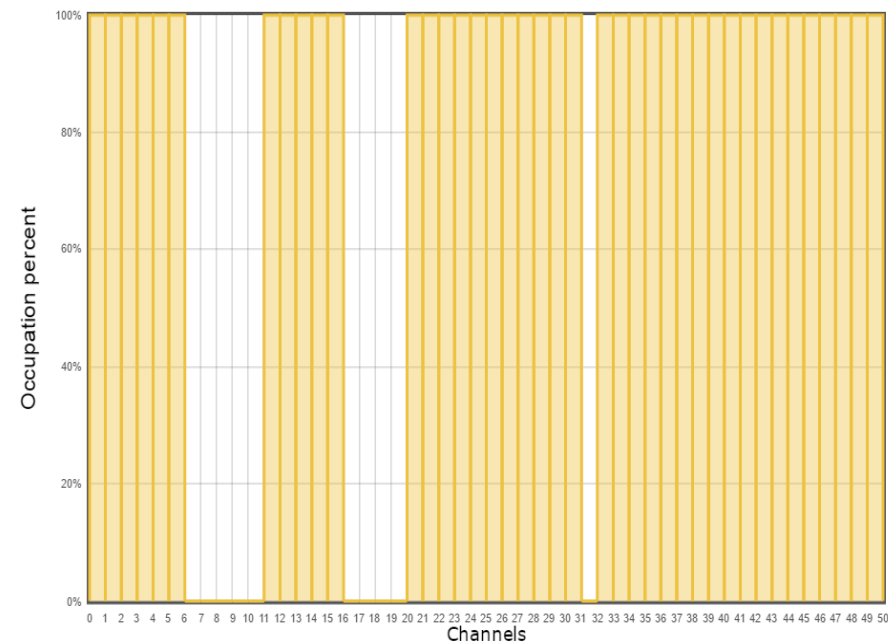
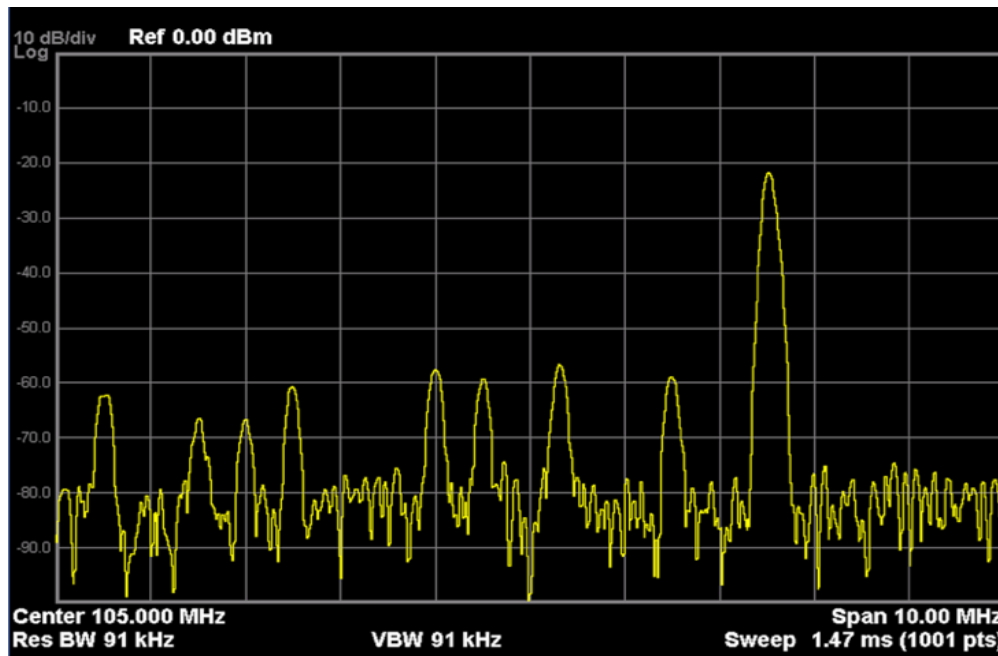


XdB method



Spectrum Program

Occupancy Measurements using energy detection for FM Broadcast



All my group at Icesi



Dissemination in TESAmerica



From left: Andres Navarro (Icesi), Daniel Rosas (TES), Cristina Gomez (UPB), Alvaro Patiño (TES)

TESAmerica Team



LESSONS FROM THIS ENDEAVOR

Lessons

- Success of this project is the result of a long term relation between people.
- And the trust developed along the years.
- With a visionary CEO in TESAmerica.
- It is a matter of people, not institutions.
- This successful Project is the result of a dream and a lot of work between colleagues and friends committed to the development of the country.

THANK YOU

