

Invited Speech

Spectrum Engineering Towards 5G: Helping to Ensure Efficient and Interference-free Wireless Communications

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SUMMARY

With the current use of mobile devices across the world, with increasing demands on bandwidth resources, solving the congestion in the radio spectrum is becoming a challenging task to spectrum regulators. Radiocommunication systems must share the resources efficiently using different multiplexing techniques using space, frequency or time dimension. Sharing and compatibility studies are required to assess the possibilities for radio systems to coexist in the same or in adjacent frequency bands.

SEAMCAT® (www.seamcat.org) is a software tool based on the Monte-Carlo simulation method, which is developed within the frame of European Conference of Postal and Telecommunication administrations (CEPT). This tool permits statistical modelling of different radio interference scenarios for performing sharing and compatibility studies between radiocommunications systems in the same or adjacent frequency. SEAMCAT is used by many regulatory agencies across the world for various spectrum sharing and compatibility studies such as between mobile systems and terrestrial broadcasting networks.

The workshop will start by presenting the modelling principles used by SEAMCAT and how to configure a coexistence scenario between heterogeneous radio systems. After that, the attendees will be invited to install the latest version of SEAMCAT in their laptops and several hands-on examples will be performed and discussed:

1. Unwanted emissions and receiver performance concepts;
2. Co-channel interference between fixed links;
3. Adjacent-channel between mobile systems;
4. Modelling Interference scenario between 5G systems and fixed satellite systems.

BIOGRAPHY



Dr. Rogério Dionísio is an Assistant Professor of the Polytechnic Institute of Castelo Branco, Portugal. He has been lecturer of telecommunication and electronics courses since 1999. As a researcher at Instituto de Telecomunicações (Aveiro), he participates in several European research projects on optical networks (MOTION, THRONE, TOMAR-PON, CONTACT) wireless communications (CREW, Fed4FIRE, WHiSFUL, MONROE, FLEX) and networks of excellence (BONE, EURO-FOS). He is the author of several journal and conference publications and his main research interests are advanced signal processing, all-optical modulation techniques for communication systems, radio spectral coexistence analysis (PHY level), sensor network and cognitive radio systems.

He is the co-founder Allbesmart, a technology-based start-up that develop IoT solutions for smart cities.

He currently serves as a reconfigurable radio systems consultant to the European Commission (DG GROW), for the implementation of a delegated act for the Radio Equipment Directive - RED, whose Articles 3(3)(i) and 4 provide provisions supporting the market introduction of software reconfigurable radio equipment in Europe.

He is a senior member of the IEEE since 2012, member of the Portuguese Society for Optics and Photonics (SPOF), telecommunication expert and senior member of the Portuguese Association of Engineers (Ordem dos Engenheiros) since 2015.