

Seminario de análisis matemático y aplicaciones
Analisi matematikoa eta aplikazioak mintegia

Spiral Based Modulation: A Tool for Tomorrow's Telecommunications

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ABSTRACT: Today's Telecommunications are based on major contributions to the information theory made by Fourier, Nyquist and Shannon. The information theory by Shannon and Nyquist provides the framework for defining the maximum capacity of information transfer associated to a certain bandwidth (expressed in terms of Fourier transforms) and a certain transmission channel quality (noise). Modulation is the technique that encodes information messages on the characteristics of sine/cosine functions. Currently the modulation process is stationary over the period of a transmission symbol and it is that stationary condition the environment that makes Fourier the perfect (most used) tool for bandwidth analysis. SBM changes the paradigm by using non-stationary signals within the symbol transmission period and uses the specifics of an spiral to increase the number of bits (information quantity) conveyed by symbol. The non-stationarity condition changes the possible analysis tools when looking at the spectrum (bandwidth) and also has implications on the basic building blocks of a telecommunication system.

The seminar will have three parts. The first one will overview the basics of information theory and the translation of that theory into practical telecommunications systems, highlighting the mission and implications of modulation techniques. The second part will describe the proposal Spiral Based Modulation (SBM) as a tool to improve the performance of telecommunication systems, by improving efficiency, increasing robustness in phase challenging channels and protecting systems from interferences. The third part will describe some of the mathematical challenges and their relationship with practical problems to be solved for implementing SBM in a practical prototype.

LUGAR / LEKUA:

Sala de seminarios de la sección de matemáticas
Matematika ataleko mintegi gela

DÍA Y HORA / EGUNA ETA ORDUA:

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